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Rock Products

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—Timkens stand it

Shock load is the normal load of Rotex rock screens, built by the Orville-Simpson Co., Cincinnati, Ohio. To handle up to 72 tons per hour Rotex screens are equipped with Timken Tapered Roller Bearings.

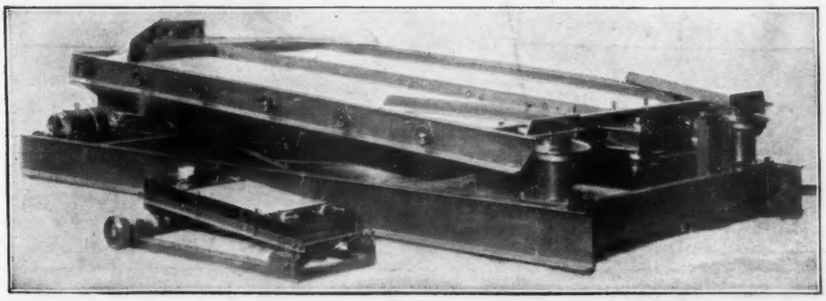
The intrinsically greater load capacity of Timkens fits them particularly for the severity of this work. Simple, compact mountings, made possible by Timken taper, carry the ceaseless variation of radial and thrust stresses set up by Rotex "gyrating" action.

The elimination of excess friction reduces power costs.

The ease of enclosing and lubricating Timkens combines with Timken-made steel and Timken design to assure low upkeep for an extremely long life.

THE TIMKEN ROLLER BEARING CO., *CANTON, OHIO*

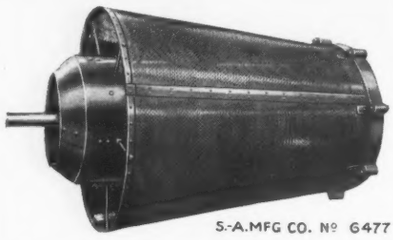
TIMKEN *Tapered Roller* **BEARINGS**



MEMBER A.B.C. *The Only Paid Circulation in this Industry* MEMBER A.B.P.

Printing of This Issue Is 5200 Copies. Next Issue Will Be January 23

Greater Quantity Production of Clean Gravel Is a Certainty with S-A Gilbert Screens



S-A.MFG CO. Nº 6477

S-A Engineers have devised an ingenious and effective supplementary equipment to the Gilbert Washing and Separating Screen. Within the standard 84 in. S-A Gilbert Screen is mounted a cylindrical steel barrel securely held in place by supports which are fastened to the screen shell. Within the steel drum are suspended heavy lengths of chain which actively agitate the material and aid in loosening the soluble matter which must be taken away with the wash water.

Preliminary agitation and scrubbing of this nature greatly aids in the production of a clean product and permits the Gilbert Screens to do the final washing and separating which is their important function.

Sand moves here—swiftly and economically. That is the whole purpose of this operation.

The lake shore sand at Port Crescent, where this plant is located, is fine and clear, requiring no washing or other preparation for market. Yet the sand must be moved from the deposit to the boats at a low cost if it is to be marketed profitably. That is why this plant consists, in the main, of a Stephens-Adamson Conveying System.

There are eleven conveyors here, totaling 4,943 ft. That means almost two miles of belts. All conveyors are 30 in. wide and are of Stephens-Adamson Special Rubber Covered Belt.

Only twelve men are needed to operate the plant and the output is 7,500 tons per day.

STEPHENS-ADAMSON MFG. CO.

AURORA, ILLINOIS, and LOS ANGELES

Rock Products
CEMENT and ENGINEERING NEWS

Volume XXIX | Chicago, January 9, 1926 | Number 1

The Newest Canadian Cement Plant

National Cement Company of Montreal Erects a Three-Kiln Dry Process Plant

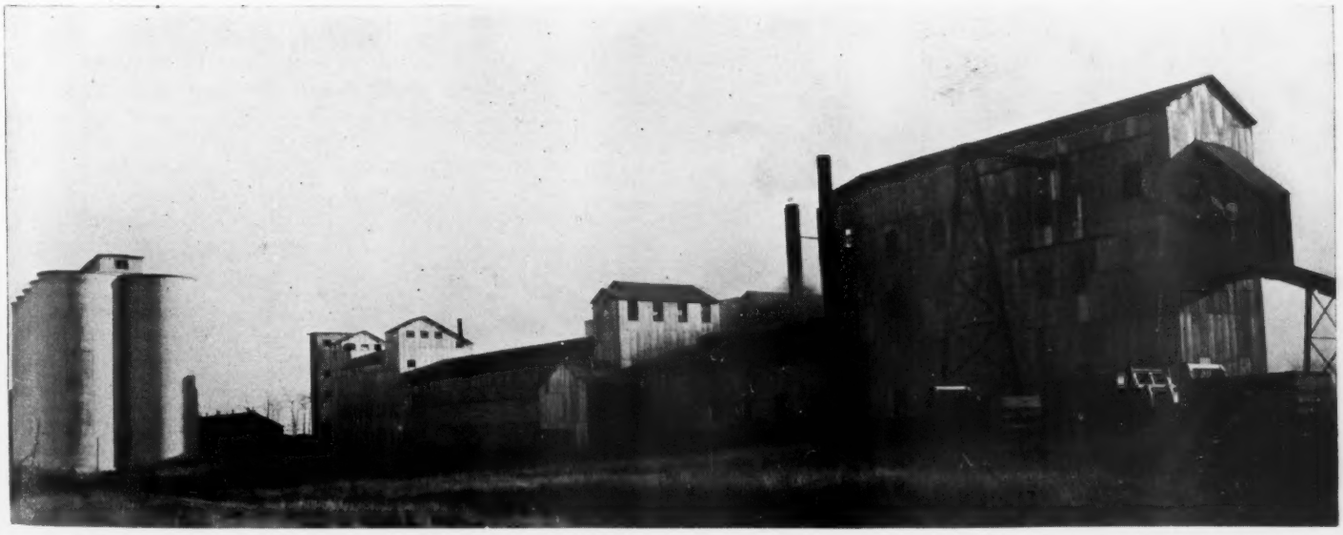
By R. H. Rogers and A. G. Turnbull
Of the Canadian General Electric Co.

A NEWCOMER in the cement industry is the National Cement Co. of Montreal, which will soon have a very modern mill in production. This 3000-bbl. dry process plant is in Montreal East, about a mile and a half from the St. Lawrence river and 12 miles east of Montreal. Montreal Island rises gently from both shores to a "height of land" with the main axis running from northwest to southeast, on which the mill is located.

The raw material is a natural cement rock found on the property, and the analysis shows that it contains the proper proportion of argillaceous and calcareous materials for the manufacture of portland cement. The overburden is light and, after the quarry is opened, stripping will not be necessary.

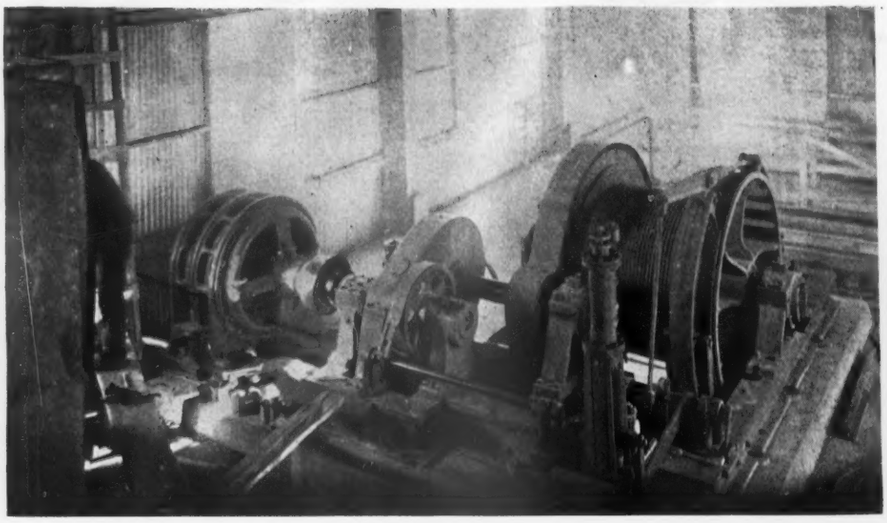
The plant has the advantage of the city water and sewerage system. It is served by the Montreal Tramways electric passenger and freight lines and by the Canadian National Railways, and only a short distance away are the piers of the second greatest port in North America. In the near future the plant will have its own wharf facilities.

Electric power at 12,500 volts, 60 cycles, 3 phase, is purchased from the Montreal Light, Heat and Power Co., served from its Orleans street sub-station over a 10-mile transmission line. The power is generated at Shawinigan Falls, 75 miles to the northeast. Virginia and Nova Scotia coal will be used for fuel in the kilns.



Plant of the (Canadian) National Cement Co. at East Montreal, Que., a dry process plant of the most modern type

W. A. Cook is general manager for the National Cement Co. Richard K. Meade and Co., engineers, of Baltimore, Md., designed the mill; Downing-Cook and Co., of Montreal, were the construction contractors,

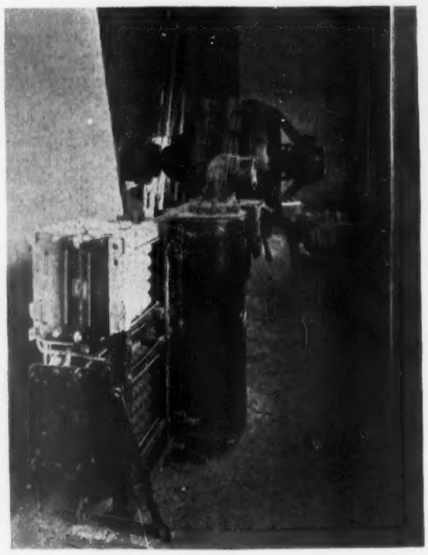


The "slope" hoist that pulls the rock from the quarry, and its motor. The duty is 22,500 lb. at 400 ft. per minute

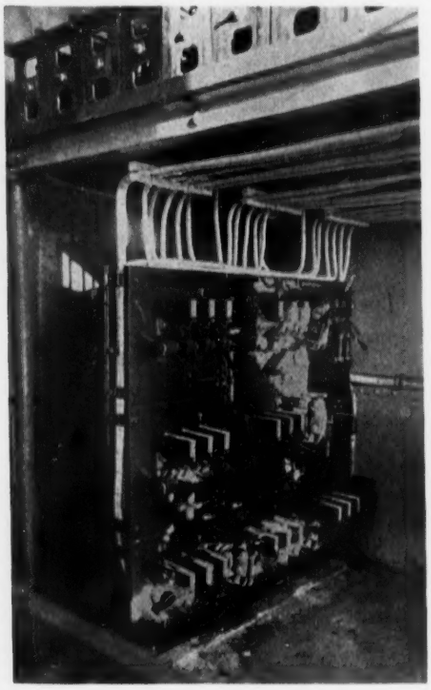
and the Chace Electric Co. of Fall River, Mass., were the contractors for installing the electrical equipment. The Canadian General Electric Co. furnished the electrical machinery.

The quarry was opened for the production of the crushed stone which was used in the concrete foundations for the buildings and machinery. The buildings which house the machinery are steel frame with corrugated iron siding and roofing. The stone storage, blending silos and cement storage silos are of reinforced concrete.

The incoming power lines are protected by aluminum oxide film lighting arresters. Within the substation are two 400-ampere 15,000-volt circuit breakers, three 12,100 2300-volt, 1667-Kva. transformers and three 12,100, 575-volt, 333-Kva. transformers. Seven feeder panels with 400-amperes 15,000-volt oil switches supply 2200-volt power by underground distribution to the crusher building, raw grinding mills, raw tube mills, finish grinding mills, finish tube mills, kiln building (firing end) and a transformer panel for lighting. Five feeder panels with 4500-volt oil switches supply 550-volt power, also by underground distribution, to stone dryers and storage, raw and clinker grinding building, kilns and blending silos, clinker dryer and storage and pack house. The motors are arranged in 12 groups and all the motors in each group can be stopped by a push-button station located at each motor and also at strategic points where continuous attendance of an operator is required.



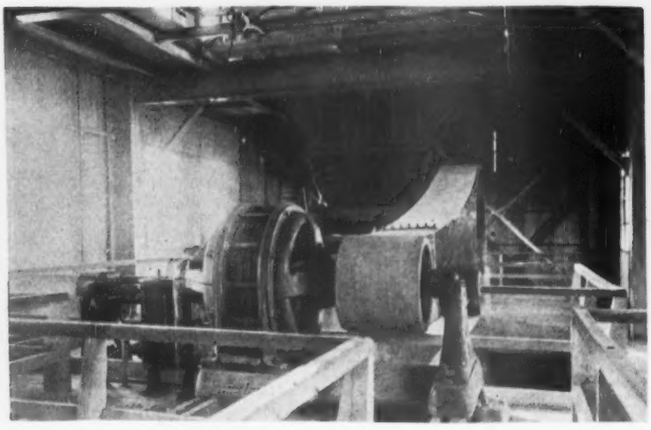
Motor and control for driving "super-hammer" mill

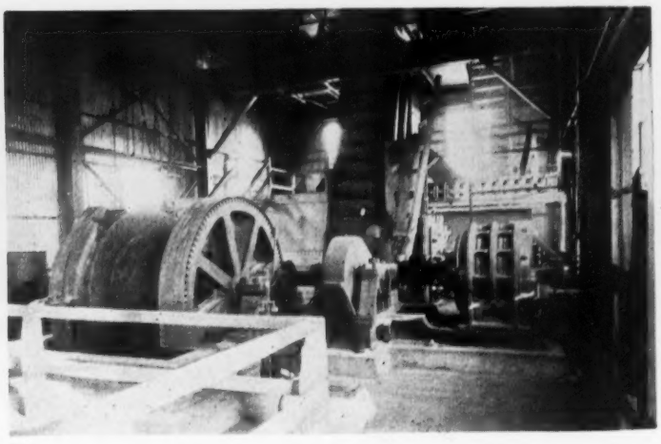


Electrical contactors of hoist motor

The usual indicating and recording meters and a 60-Kva., 2300/115/230-volt lighting transformer complete the principal features of the substation.

The quarry will be worked on a 45-ft. face with a bottom grade of 1½% toward the mill. Other levels can be developed as necessity requires. At first the loading of the 15-ton end dump quarry cars will be by derricks which are to be superseded by a power shovel as soon as the quarry is developed. Tracks on a 25 deg. incline lead from the quarry floor into the crusher



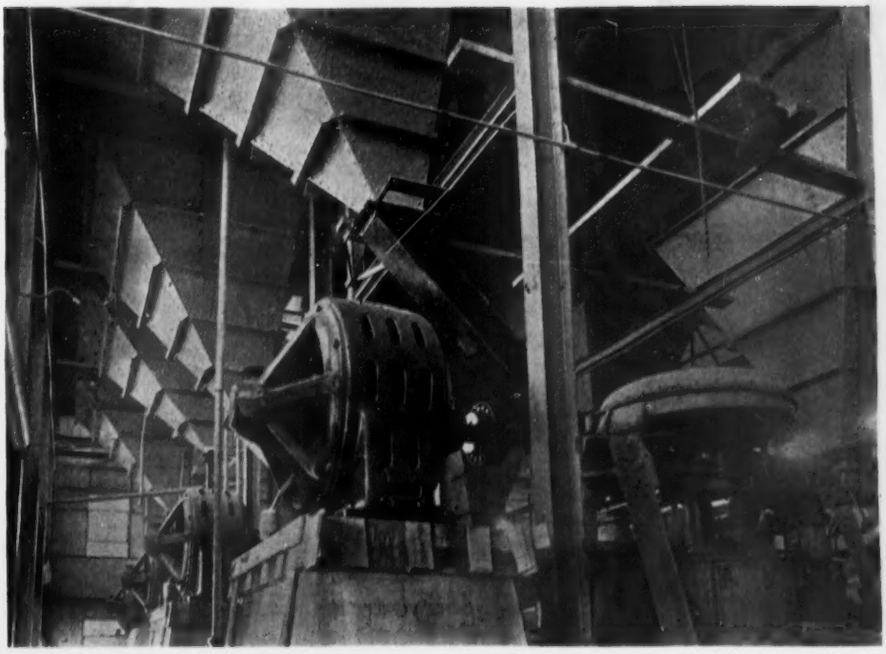


Left—The "roll jaw crusher" which is the primary breaker. Right—Another view of the "slope" hoist showing the drive and gear

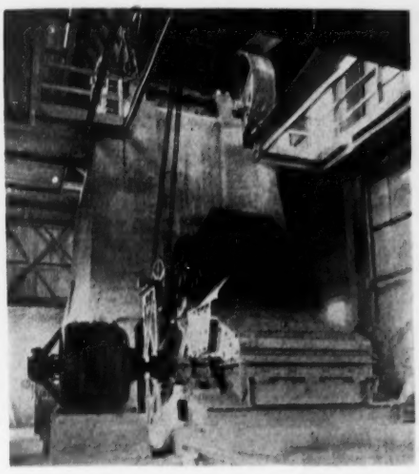
building up which the car is drawn.

The quarry cars are raised and dumped by a 350-hp. Flory heavy duty hoist, equipped with a Royer emergency governor for preventing over-travel and overspeed in either direction. Over-wear of the brake shoes is prevented by a push-button switch, actuated by a cam, depending upon brake-shoe travel.

The quarry hoist is driven by a 350-hp., 600-r.p.m., 2200-volt, wound-rotor motor with master switch, magnetic primary and secondary contactors, necessary resistance and oil switch. The master switch, hand and maximum torque switches and the air brake valve are in a tower room overlooking the quarry, the hoist and the crusher. The cable leads over a sheave above the hoist to the hauling bail of the car, so



Primary mills and motors for raw and finish grind. The discharge from these mills goes to tube mills in both raw and finish grnding

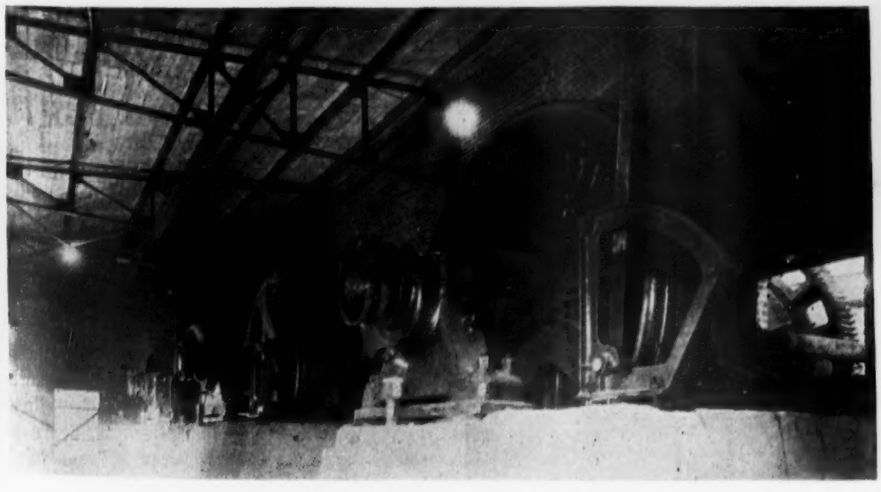


The "super-hammer" mill and drive

hinged as normally to hold the end door closed. When the car nears the top of the incline, auxiliary wide-gage wheels at the rear run up a steeper incline and the bail pulls up, releasing the door so that the load of stone is discharged into the crusher hopper. The primary crushing is done by a Pennsylvania 36x60-in. roll crusher. At 35 r.p.m. it has a capacity of 250 tons per hour. The hopper is 7 ft. 4 in. by 9 ft. 5 in. with the back shield hinged to let down for a working platform. The crusher is belt driven by a 200-hp., 600 r.p.m., 2200-volt, wound-rotor motor, having a drum controller, resistor, oil switch and ammeter. An apron feed conveyor driven from the crusher intermediate shaft conveys the broken stone to a Pennsylvania Super G-12 hammer mill which reduces the material to approximately 1½ to 2 in. cubes. The motor is rated 300 hp., 720 r.p.m., 2200 volts.

A 10-ton, hand controlled Herbert-Morris transfer crane serves the crusher building. It has a 40-ft. lift and 28-ft. span. A stationary extension over a railroad track, over which the crane trolley can be run, provides for quick service between the crusher building and the machine shop in handling parts to be repaired.

A 42-in. continuous bucket elevator, with 25-hp. motor and worm gear drive, elevates the rock to the dryer feed bin, whence it passes reciprocating feeders to two 6x70-ft., 3 r.p.m. direct fired rotary

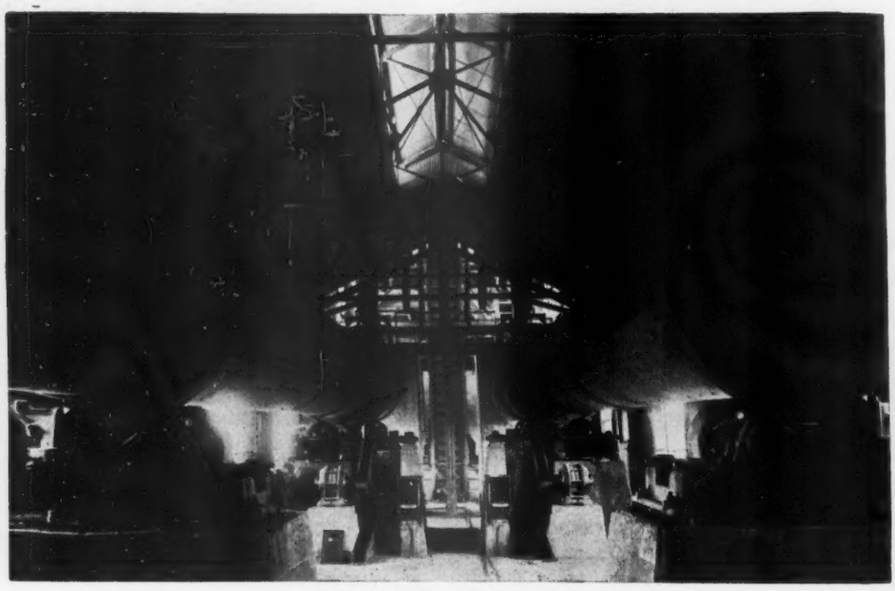


The tube mill motors of the "super synchronous" type are placed in a separate room

High voltage distribution

dryers. The dryers are driven by 15-hp. motors through Reynold silent chains. Coal is dumped from cars into a track hopper, elevated to a bin and passes through an Aero pulverizer to the two dryers. The pulverizer is driven by a 40-hp., 1200-r.p.m., direct-connected, wound-rotor motor. The dried stone is elevated by a 20-hp. bucket elevator to the stone storage which will hold material for eight days' production.

Two 160-ft. by 24-in. belt conveyors with automatic, self-propelling, self-reversing trippers receive the dry stone from the elevator and distribute it evenly into the dry stone storage. Two 16-in. belt conveyors underneath the stone storage, and provided at the discharge ends with magnetic head pulleys for the extraction of tramp iron, are fed each by two short belt feeders driven by individual 2-hp., wound-rotor motors which serve also to proportion the mix. Two 7½-hp. motors drive the two 16-in. reclaiming conveyors underneath.



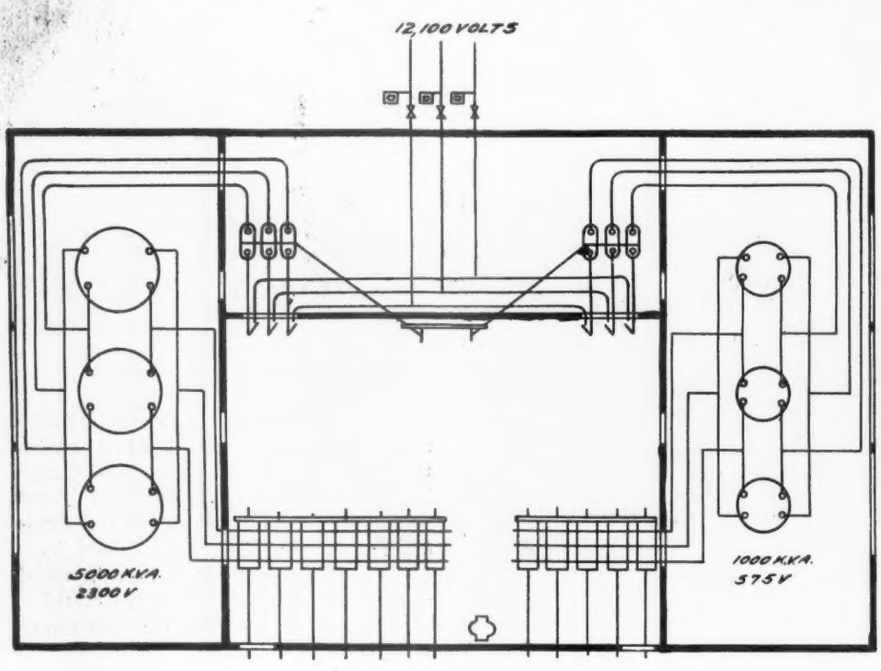
The two 6x70-ft. stone dryers. Dried stone is stored for winter use to obviate stoppage of operations from freezing

The raw and finish grinding room contains four Bradley-Hercules mills and four tube mills. Two Bradley-Hercules mills and two tube mills are for raw grinding and the same arrangement holds for the finish grinding, both sets being in charge of one foreman. The second Bradley-Hercules mill and its corresponding tube mill may be interchanged between the raw and the finish grnid by means of gates in the conveyor systems. Screw conveyors move the Bradley-Hercules mill output to a bucket elevator which supplies the tube mill bins through screw conveyors. The output of the tube mills is fed by screw conveyors to a Fuller-Kinyon conveying system which in turn conveys the raw matreial into the six blending silos.

The motors in the raw and finish grinding dpeartment are of interest. Four 300-hp., 400-r.p.m., 2200-volt, wound-rotor motors drive the Bradley-Hercules mills, being directly connected to the mill gear shafts. The 7x26-ft. single compartment tube mills are driven by four 500-hp., 180-r.p.m., 2200-volt, super-synchronous motors located in a motor room. These motors do not require magnetic clutches as the mechanical arrangement of this type of motor makes all its pull-out torque available for starting. The rotating frame or stator is brought up to synchronous speed with the rotor stationary; then, by applying the mechanical brake to the stator, the rotor comes up to speed as the stator slows down. These synchronous motors are used to improve the power factor of the electrical system which is a decided advantage to both the producer and consumer of the power.

The pan elevator from stone storage to Bradley-Hercules mill bins is driven by a 15-hp., 900-r.p.m., 550-volt motor through worm gearing. The screw conveyor beneath the mills and the bucket elevator to the tube mill bins are driven by a 20-hp., 900-r.p.m., 550-volt motor through worm gearing. The screw conveyor from tube mills to the Fuller-Kinyon "pump" is driven by a 25-hp., 600-r.p.m., 550-volt motor with back gear attachment. The raw Fuller-Kinyon pump is driven by a 40-hp., 1200-r.p.m., 550-volt motor directly connected. Air at 45 lb. pressure is delivered to the pump.

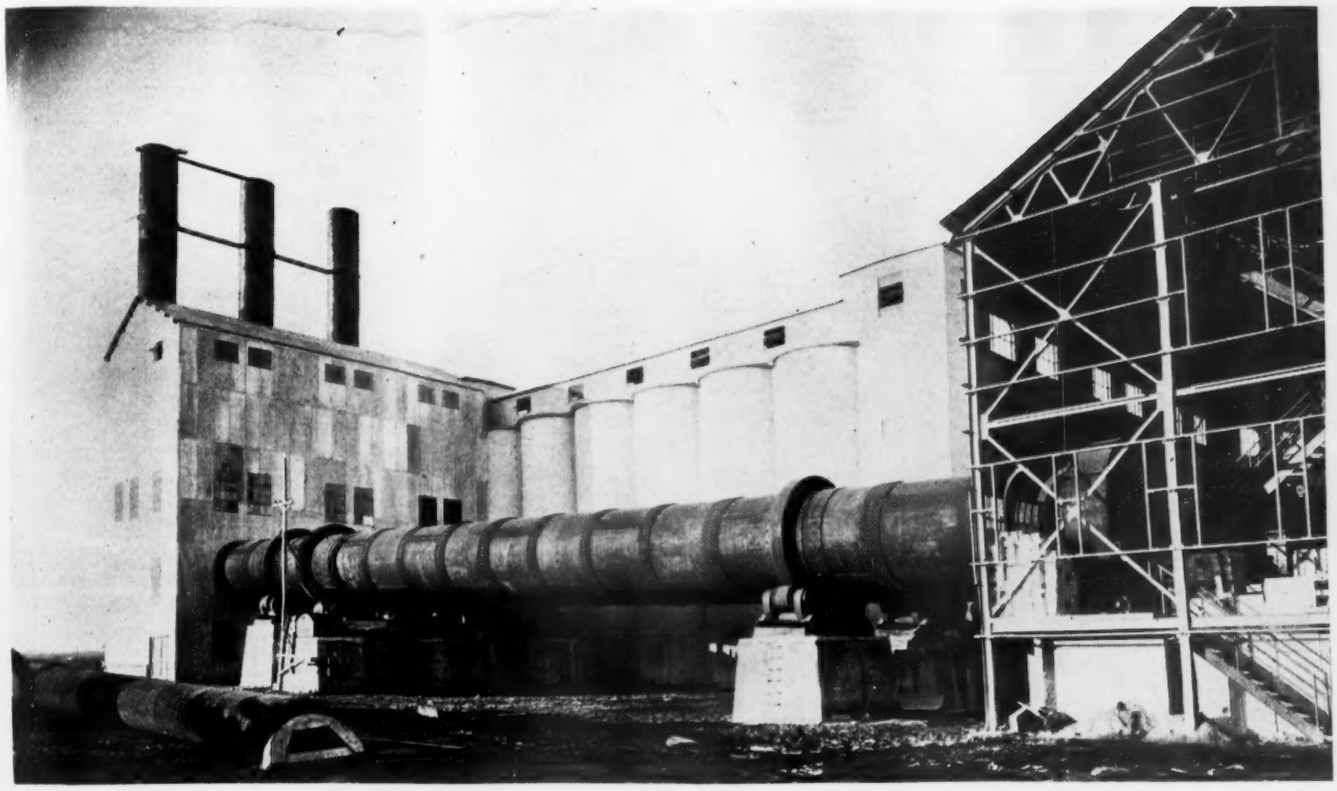
The substation transformer



Plan of substation

The blending silos discharge by selectively driven screw feeders to a screw conveyor, thence by way of a bucket elevator and screw conveyors to the kiln bins. Adjustable speed motors rated 3 hp., 1690 r.p.m., 550 volts, operate screw feeds to the kilns. Below the dust chamber clean-out doors a screw conveyor feeds recovered material back to the kilns.

There are three 9x160-ft. kilns installed, each driven by 50-hp., 685-r.p.m., 550-volt,



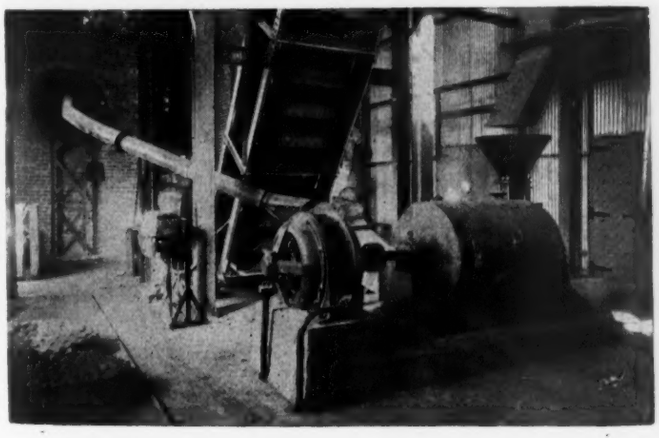
The three kilns. Each is 9 ft. in diameter and 160 ft. long. Photo taken during construction

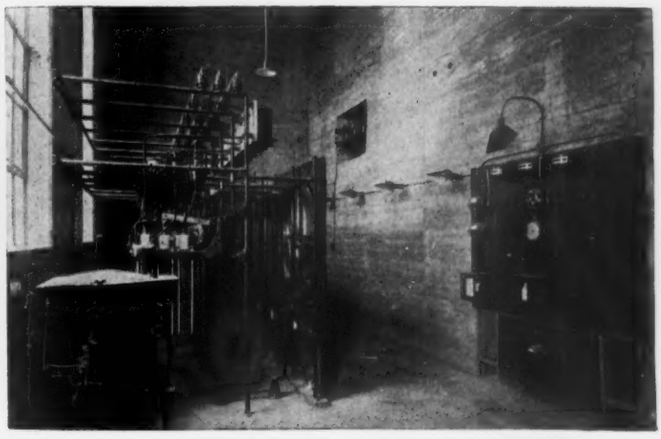
wound-rotor motors. The kilns were built by the Vulcan Iron Works and are of the two-tire type, made of ¾-in. plate with 9-in. firebrick lining in the burning zone and 6-in. firebrick beyond. Three stationary Aero pulverizers deliver fuel to the kilns, while a fourth, on truck and rails, will serve as a spare for any one of the stationary pulverizers. Each pulverizer is driven by a directly connected, 100-hp., 1200-r.p.m., 2200-volt, wound-rotor motor. A hand-fired coal dryer, 6x70 ft., discharges into a bucket elevator and by screw conveyor to the pulverizer bins.

Hot clinker is discharged over a concrete protecting wall by special drag-chain conveyors operating in reinforced concrete troughs lined with scoria blocks. The clinker storage is 220x100 ft., spanned by a 50-ft. lift Shepard crane with a 2-yd. clamshell bucket. The clinker will be spread from the discharge dumps by the bucket and reclaimed by the same bucket to a convenient hopper. Hot and cold clinker will be alternately delivered to the hopper so that the cold clinker will be well dried. A short pan conveyor discharges from the hopper to a 6x70-ft. dryer which, in turn, discharges into an automatic weighing scale. This device is so interconnected with the gypsum feed from the gypsum silo as to feed automatically the required amount of gypsum into the clinker. A short belt conveyor discharges the mix to a bucket elevator, thence by screw conveyors to the Bradley-Hercules mill bins. The conveying system from these mills to the tube mills and to the storage silos is similar to the raw conveying system.

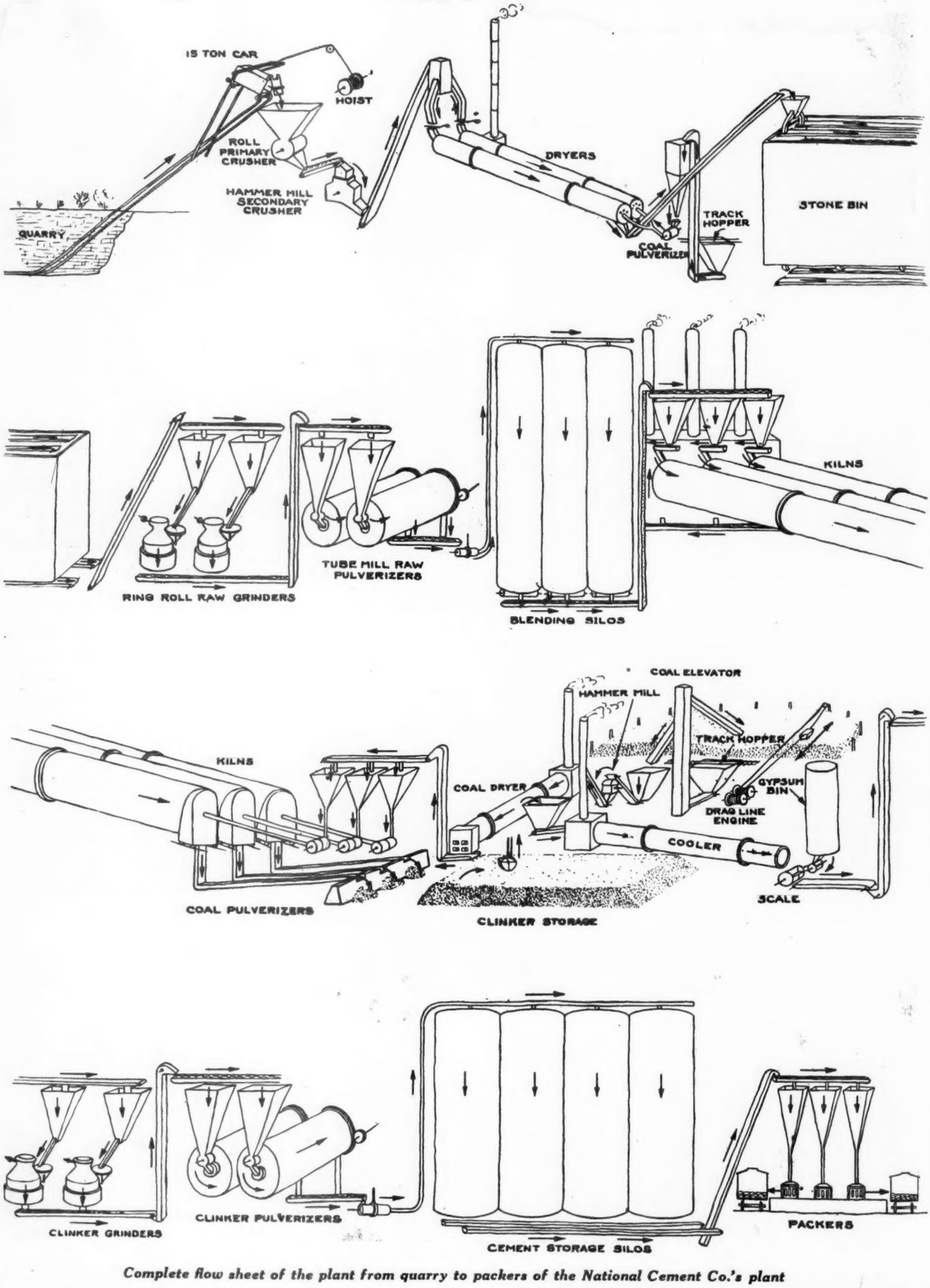
The finished cement stock house will hold 100,000 bbl. Screw conveyors under the silos discharge to a bucket elevator which supplies the bins over the three Bates packers. Tracks are provided for shipping from both sides of the pack house.

The equipment for the coal storage and reclaiming system was furnished by the Canadian Mead-Morrison Company and consists of track hopper with apron conveyor to an elevator having two discharge chutes. One chute discharges across the track to the storage area. A dragline scraper distributes the coal over a semi-circle, 300 ft. in radius, to a depth of 14 ft. About 36 snatch-block posts for the outhaul cable sheave encircle the storage space which will





Left—One of the unit coal pulverizers and pipes to the kilns. Right—The 2200-volt feeder panels in the substation



Complete flow sheet of the plant from quarry to packers of the National Cement Co.'s plant

store 30,000 tons of coal. The same drag scraper operated by a 60-hp., squirrel-cage motor will reclaim the coal to the track pit. The second chute from the elevator discharges coal from car or from storage to a hopper over an apron feeder to a single-roll coal crusher. A bucket elevator feeds the 6x70-ft. coal dryer previously mentioned.

An air-compressor room is located in the end bay of the crusher house. The compressors are: one compound 16- and 18-in. by 12-in., 260-r.p.m., 100-lb., and one simplex 14x12-in., 250-r.p.m., 100 lb., both of Canadian Ingersoll-Rand make The first is driven by a 125-hp., 720-r.p.m., 2200-volt squirrel-cage motor and the second by a 100-hp., 900-r.p.m., 2200-volt, squirrel-cage motor. The output of air will be used in the quarry, in the Fuller-Kinyon conveying systems and for various other purposes.

The machine shop is a reinforced concrete building with continuous sash and provided with a crane-way its entire length. It is fully equipped for making any repairs to machinery in the plant. The same building contains the electric shop, store room, offices and laboratories. The last two are temporary and suitable permanent quarters will be provided in the near future.

Throughout the plant there are a large number of small Canadian General Electric motors for general purposes, besides the units already mentioned.

Full provision has been made for doubling the capacity of the plant without disturbing the present layout. Provision has been made in the plant layout for waste heat boilers and power plant should these be desirable at any time in the future.

Studies of Bond Between Concrete and Steel

FOLLOWING are conclusions drawn from a study of the bond between concrete and steel and published in bulletin No. 17 of the Structural Materials Research laboratory, Lewis Institute, Chicago:

1. A steel bar embedded in concrete offers considerable resistance to a pull-out load. Slipping of the bar begins at a bond stress of about 10 to 15% of the compressive strength of the concrete, but considerable additional load is taken before the ultimate bond resistance is reached. For pull-out tests of the type used, 0.0005 in. end slip of bar occurred at 55 to 60% of the maximum bond; for mixtures leaner than 1:1, the maximum bond was about 24% of the compressive strength of the concrete and came at an end slip of about 0.01 in., regardless of the characteristics of the concrete.

2. Bond and compressive strength increased with age of the concrete from 7 days to 1 year. For 1:5 concrete of water-ratio 0.88, the bond at 1 year was 134% of the 28-day value and the compressive strength was 148%.

3. Bond responded to changes in water-ratio of the concrete in much the same way as compressive strength; increase in water-ratio due to use of wetter concrete, less cement, or an excess of fine aggregate, resulted in material reductions in both bond and compressive strength. Other tests have shown that the same statement applies to the modulus of elasticity of concrete, impermeability, resistance to wear and resistance to destructive agencies such as weather, sea and sulfate waters, etc.

4. For mixtures richer than 1:1, the bond fell off, probably due to the greater volume changes during hardening, which is characteristic of such mixtures.

5. The use of 4% of the 28-day compressive strength of concrete as the working stress in bond for plain bars, as specified by the Joint Committee, is justified; this gives a factor of safety of about 2½ to 3 against first slip.

6. The use of crude oil to replace mixing water, in general, caused a reduction in both bond and compressive strength of concrete. Five per cent of oil reduced bond at 28 days about 20%; at 1 year, about 6%; compressive strength at 28 days and 1 year was reduced about 3%.

7. Replacing cement with hydrated lime decreased the compressive strength and bond about 1.2% for each 1% of hydrated lime in terms of volume of cement or about 2.0% for each 1% by weight.

8. The pull-out test of the form used in this investigation is a satisfactory form of specimen for comparative studies of bond.

The Plant of the National Cement Company

IN commenting on this plant Mr. Meade, the designing engineer, writes as follows to Rock Products:

"We have used the roll jaw crusher for primary crushing because the material is soft cement rock and these crushers have large capacity at low first cost. The capacity is for 6000 bbl. so that the plant capacity may be doubled without altering this feature.

"The dryers are heated with pulverized coal and you will note that we are using the unit system. We have found it just as satisfactory as the central station system for pulverized coal.

"The stone house is designed with a moving tripper on a belt which deposits the stone over the whole area of one side of the stone house, the latter being divided in two bins by a lateral partition. The idea of this is to provide uniformity. Dry stone is stored on account of the danger of freezing in the winter.

"You will note that the raw and clinker mills are in one department and mills are interchangeable on either raw material or clinker.

"Blending bins have been provided designed to take the place of the slurry tanks of the wet process. We have found by employing them we can obtain as uniform material as would be obtained with the slurry tanks.

"The kilns revolve at a constant speed, but we can increase or decrease the feed, as the feeding device for raw material is controlled by a variable speed motor. In order that repairs to a pulverizer may not shut down a kiln, we have provided a spare pulverizer on a track that may be connected to a kiln in a few minutes.

"The method of drying clinker taken from storage is to pass this through a 6x60-ft. cylinder together with fresh clinker. The heat of this serves to dry the seasoned material."—The Editors.

Properties of Cement-Lime Mortars

AN increase in workability and possible reduction in cost are the principal reasons why lime might be used to advantage in cement mortars, according to results secured by the U. S. Bureau of Standards.

When the lime plaster is gaged with cement, it still retains considerable of its former workability, and has gained in strength, while the time of set is reduced.

In this work the Bureau found that when cement paste and lime paste were brought to the same consistency, a much greater percentage of water was required by the lime than by the cement. With this relation holding, the percentages of mixing water in cement mortars and in lime mortars increased with a decrease in the percentage of sand. A cement mortar with lime added requires extra mixing water, but this extra water increases shrinkage possibilities, therefore lime should be limited in cement mortars where it is desired to keep shrinkage low. It is possible to keep shrinkage low by the use of a high percentage of sand in mortar.

The density of lean cement mortars may be increased by the addition of a small percentage of lime. Where the cement mortar is not richer than 1:2, the addition of lime may result in increasing the strength. The percentages of lime which may result effectively in these respects were found to increase with the leanness of the mortar. It is probable that the lime does more than act as a void filler in lean cement mortars, for it can carbonate and form a binder in the place of the missing cement.

It is not to be expected that these results will be duplicated exactly where other brands of materials or differently graded sands are used with different manipulation and under different storage conditions.

Large Increase in Advertising by Rock Products Producers in 1925

Examples of How Producers Are Increasing the Consumption and Prestige of Rock Products Both Individually and Collectively

ONE of the outstanding developments of 1925, which we did not find space to mention in our December 26 issue, is the great increase in the volume of advertising by producers and manufacturers of rock products. This is both an index of, and a cause of, the great prosperity of these industries during the past year. There is no measure for the intangible value of this advertising or publicity, but the prosperity of a business, and even of a whole industry, is often dependent upon the volume and character of the advertising matter relating to it.

Since most producers have little or no time or inclination to study the fundamental principles involved in successful advertising it may not be amiss at this time, when we have so many good examples before us, to reiterate some of those principles.

A great mistake that many inexperienced advertisers often make is to expect all advertising to make direct sales. There are, of course, instances, and kinds of merchandising, where sales are made almost exclusively through advertisements, such for example as the catalogs and advertisements of mail-order houses; but this is a very small factor in most advertising programs and a negligible factor in selling rock products. Advertising, except in the case of mail-order houses, can practically never replace personal salesmanship. But it is a necessary auxiliary and aid to personal salesmanship in the case of nearly all commodities in modern business.

General Classes of Advertising

Leaving out of consideration the type or class of advertising already mentioned—

TOWARD TOMORROW WITH LEHIGH CEMENT
"WHY not make industrial buildings more attractive?" said a few engineers and architects not long ago, and a new epoch began. Looking "toward tomorrow," both professions are planning greater, more efficient, better industrial buildings. Concrete, with its low-cost construction, will be their principal reliance.
The increasing demand for concrete construction will find Lehigh shaping its policy with eyes to future needs, just as today it is meeting all requirements with nineteen mills from coast to coast.
Any engineer or architect can secure the series of renderings by Hugh Ferriss —"Toward Tomorrow," of which the above is one. Address Lehigh Portland Cement Company, Allentown, Pa., or Chicago, Ill.
TOWARD TOMORROW WITH LEHIGH CEMENT
THOROUGHFARES of two levels offer the greatest relief from traffic congestion in the opinion of many engineers and architects who are looking "toward tomorrow." The increasing demand for concrete construction will find Lehigh shaping its policy with eyes to future needs, just as today it is meeting all requirements with nineteen mills from coast to coast.
Any engineer or architect can secure the series of renderings by Hugh Ferriss—"Toward Tomorrow," of which the above is one. Address Lehigh Portland Cement Company, Allentown, Pennsylvania, or Chicago, Illinois.

Good example of "prestige" advertising—also known as "institutional" advertising

Reliable Contractors

will use only washed and graded sand and gravel

It is a selfish matter with the contractor who does your building to insist on having washed and graded sand and gravel. He knows that concrete made with run-of-bank sand and gravel will crumble. He knows that his reputation depends on using WASHED AND GRADED SAND AND GRAVEL.

If your contractor is willing to use poor sand and gravel—can you depend on his work?

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Be Sure You Use Only Clean Sand and Gravel

WHETHER you are going to build a concrete pavement, a foundation, a silo, or any construction using concrete, be sure that you use only washed and graded sand and gravel.

You save nothing by the use of unprepared sand and gravel in concrete. You run the serious risk of life reputation and investment if you allow ordinary "bank run" sand and gravel to be used.

Only sand and gravel which is thoroughly washed and screened before it is delivered to the builder is safe. Unclean sand and gravel means crumbling concrete later on because of the organic matter mixed with it. There is a responsible dealer in your town who can supply you with WASHED and GRADED sand and gravel.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Good Concrete Requires Clean Sand and Gravel

THAT clean, well graded sand and gravel is absolutely essential if you want safe, permanent, economical, concrete work is emphasized by such authorities as the Federal and State Governments, by the American Society for Testing Materials, the Portland Cement Association, and by all others interested in safety and economy in concrete work. In its **Concrete Data for Engineers and Architects**, the Portland Cement Association says:

"Aggregates should be clean, free from coatings or grittiness impurities and structurally sound. Furthermore, proper size and grading of aggregates, or proper proportioning of fine and coarse aggregates, may double the strength of concrete."

The effects of organic matter found in ordinary "bank run" sand and gravel result in weakened and crumbling concrete, sometimes in but a few months.

There is a responsible dealer in your town who can supply you with washed and graded sand and gravel.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

You would'nt pour cement on the ground because it would' get full of dirt"

Sand and gravel which is taken from its natural deposit and used in concrete without being washed and screened always contains organic matter. This organic matter in the ordinary "bank run" sand and gravel forms tannic and gallic acids which destroys concrete.

There is a responsible dealer in your town who can supply you with WASHED and GRADED sand and gravel.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Your Architect Knows About Sand and Gravel

"Washed and Graded Sand and Gravel" is specified by architect and engineer. There is a reason for such universal acceptance by men whose business it is to advise and direct in matters of building.

In smaller undertakings, in which an architect need not be consulted, use the same good judgment on your own part. Insist that the Sand and Gravel in your concrete be Washed and Graded.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Crumbling Concrete

Is Caused by Unclean Sand

BULLETIN NO. 1077, issued by the U. S. Department of Agriculture, says,

"Sand which contains even a small percentage of organic impurities is unsuitable for the manufacture of such impervious concrete as greatly affects the strength of the concrete."

This organic matter, commonly called dirt, in the ordinary "bank run" causes tannic and gallic acids which destroy the cement after setting. Sometimes in but a few months the result is a dangerous weakening where it has been used.

There is a responsible dealer in your town who can supply you with washed and graded sand and gravel.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Unclean sand and gravel is *dangerous*

ONLY sand and gravel which is thoroughly washed and screened before it is delivered to the builder is safe for building purposes. Unwashed sand and gravel means crumbling concrete later on because of the organic matter mixed with it.

In a book on this subject, Prof. P. C. Price, Director of the Highway Material Laboratory, the Georgia School of Technology, Atlanta, Ga., says that organic matter in sand "causes tannic and gallic acids, which destroy the cement after setting."

The effect of this organic matter found in ordinary "bank run" sand and gravel may not show up for months, but sooner or later the result will be a dangerous weakening where it has been used.

There is a responsible dealer in your town who can supply you with washed and graded sand and gravel.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Tannic Acid At Work

"Even one tenth of one percent of Tannic Acid found in bank-run sand and gravel seriously affects the strength of concrete."

—BULLETIN NO. 1077 U. S. DEPT. OF AGRICULTURE.

Use only Washed and Graded Sand and Gravel for Safe, Permanent, Economical concrete work.

You actually save on expense because Washed and Graded Sand and Gravel requires less cement.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

CLEAN SAND AND GRAVEL MAKES BETTER CONCRETE

If you would build safely, more economically, and permanently, use washed and graded sand and gravel. It makes better concrete.

A report of the U. S. Geological Survey declares: "It has been found by experiment that to use run-of-bank (Unprepared) material for structural concrete work is a haphazard and careless method."

There is a dealer in your town who can supply you with WASHED and GRADED sand and gravel.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

After the Forms Are Down the Real Test Begins

Unwashed sand and gravel means crumbling concrete later on. Concrete of properly prepared sand and gravel requires less cement, is stronger than concrete made with ordinary "bank run" sand and gravel.

"The average improvement in strength of artificial grading runs about 14 percent. The best artificial graded aggregate requires 12 per cent less cement than a like mixture of natural material."—Report of Feller and Thompson, Federal Authorities on Concrete.

There is a responsible dealer in your town who can supply you with Washed and Graded sand and gravel.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Unclean Sand and Gravel Contains Tannic Acid

Even One-Tenth of One Percent Means Crumbling Plaster

SAND is the chief constituent of plaster. Therefore sand is the most important element. To secure the best plaster, a sand which meets all requirements is necessary.

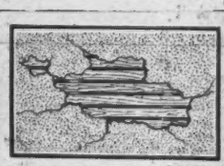
These requirements are stated by the Bureau of Standards to be—"Sand used for plastering purposes shall be free from salt and from alkaline organic or other deleterious substances."

The effect of organic matter found in the ordinary "bank run" sand is to form tannic and gallic acids which cause plaster to crumble.

These is a dealer in your town who can supply you with WASHED AND GRADED sand.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel



POOR SAND CAUSES PLASTER FAILURE

"Sand used for plastering purposes shall be free from salt, alkaline, vegetable or other deleterious substances"—

SAYS THE BUREAU OF STANDARDS

That Means Washed and Graded Sand

Sand is the chief constituent of plaster—good plaster depends almost entirely upon the quality of sand that is used in it. The Bureau of Standards of the United States advises Washed and Graded Sand—
And the Bureau Knows.

Insist upon Washed and Graded Sand and Gravel

Illinois Sand and Gravel Association
Producers of Washed and Graded Sand and Gravel

Co-operative institutional advertising of an educational character using the country press

White Enamel
Gold Medal
and **White Lily**
Finishing

Contractors and Workmen Swear by these Brands—

It's the ambition of every dealer to handle materials and supplies that meet with unqualified approval and endorsement of contractors and their workmen.

For a Finishing and All Around Building Hydrated Lime, you need go no further than any one of our three brands. They give full and complete satisfaction every time and all the time.

The quality is in the limestone—that's the reason. Our quarry is a deposit of limestone that has no superior for making lime that is white as snow, absolutely pure, wonderful for spreading qualities and always uniform.

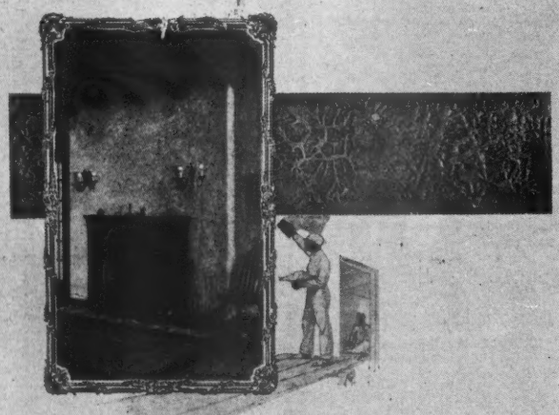
As pioneer manufacturers of Hydrated Lime, and backed by a continuous experience of over a quarter century in producing quality lime, we have the natuarl resources and facilities to produce a superior product.

If you want a Finishing and Building Lime that will always give satisfaction and will prove to be a big repeater, stock one of our brands.

The Woodville Lime Products Co.
TOLEDO, OHIO

Hydrated Lime

"The Quality is in the Limestone"



Nowhere Else In All the World

IN the magnesium limestone deposits at White Rock, Ohio, nature has provided a rock that is acknowledged the best for producing finishing lime. Nowhere else in all the world has its equal been found.

The snowy whiteness of *Tiger Finish* is due to this natural advantage *plus* a process, perfect in its completeness, which removes all acids, iron, sulphur and inert matter. The result is a lime finer than flour, which makes a putty that spreads like warm butter and covers more yards of wall surface.

The Kelley Island Lime & Transport Co.
World's Largest Producer of Lime
Leader-News Building
CLEVELAND

TIGER FINISH WALLS

Remember This Brand

when ordering your next supply of Portland Cement. Columbia Portland Cement will pave the way for more cement sales, better profits and satisfaction to your customers.

Daily production 2500 bbls.

Write for our dealer's proposition.

PITTSBURGH PLATE GLASS CO.
Largest in the World
Columbia Chemical Division — Limestone Products Department
ZANESVILLE, OHIO

Houston's

For Exceptional Value

Every sack of *Pearl White Lime* contains the highest grade Ohio Limestone, thoroughly burned and hydrated.

Pearl White Lime produces white permanent walls, quickly and economically. It is preferred by architects, contractors, and builders, for use in the highest caliber construction.

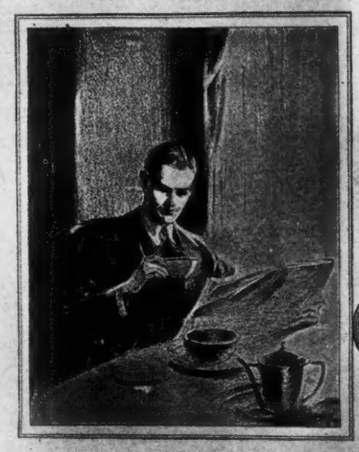
We carry all building products in stock for immediate delivery at any time. If you are not handling The Houston Line now, send for our catalogue and our interesting dealer proposition.

Sewer Pipe — Flue Lining — Chimney Tops — Wall Coping
Drain Tile — Mortar Colors — Pearl Lime — Waterproofing
Roofing — Plaster — Fire Brick — Hollow Tile

PEARL WHITE LIME

Houston Brothers Company
PITTSBURGH, PA.

Brand advertising to establish prestige and create consumer preference



SPEED SPEED

This is NOT a coffee advertisement

BUT, for the sake of argument, how *was* your coffee this morning? How well did your shaving soap lather? How is your favorite brand of cigarettes holding up?

The continued and successful sale of any product depends first on merit and then on *uniformity*. No product will give permanent satisfaction unless it is invariably and uniformly good.

And that, in a nutshell, is the reason for the continually increasing use of Speed Chemical Lime by chemical manufacturers whose requirements are most exacting. Most of them use Speed exclusively because they *know* that shipment after shipment this standard product will be dependably high in calcium oxide (average content 95%) and invariably *uniform*—chemically and physically.

Doesn't this mean something to you in the success and economy of your processes? Write for interesting handbook.

LOUISVILLE CEMENT CO., Incorporated, SPEED BUILDING, LOUISVILLE, KY.

SPEED *Chemical* LIME

Adams, Mass., plant of the New England Lime Co., where Nelco Chemical Lime is made from practically pure limestone.

NELCO Characteristics

Distinctive granular form
Unusually high calcium
Native purity
Consistent uniformity
Easy and safe to keep
Prompt shipments of any size
Seven large plants
Thirty year prestige

Nelco Chemical Lime is the only natural granular lime on the market. Its broad and crystalline grains represent almost pure chemical purity—the quality you pay for in chemical lime. There is no substitute for Nelco.

Why Distinctive *Granular* Lime Is Best for Chemical Uses—

Chemical activity is the standard of value for any lime used in manufacturing processes or water softening operations.

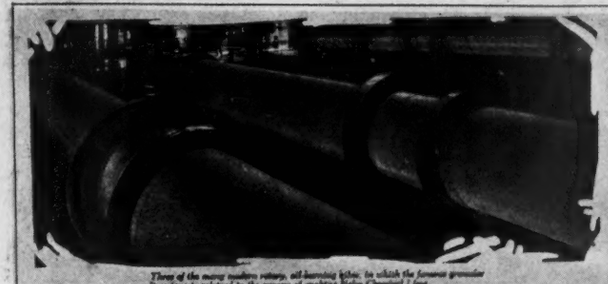
No lime can be better than the mother stone from which it is derived. High chemical properties must be inherent—they can be retained and made more effective by the science of production, but they cannot be put in mechanically.

Nelco Chemical Lime is a *natural granular* lime—a beautifully white, glistening, crystalline formation of unusually high calcium content and pristine purity. It is exclusively a product of the New England Lime Co. who first produced it. Granular lime must *not* be confused with ordinary lime, ground to resemble it.

Nelco is manufactured under perfect chemical control and comes to you a superior product in bulk or barrels, easy to handle and safe to store. Write us for analysis or send for sample for your own examination.

New England Lime Company
Pittsfield, Massachusetts

GRANULAR NELCO HIGH CALCIUM
CHEMICAL LIME



Three of the many modern rotary, oil-burning kilns, in which the famous granular limestone is calcined in the process of making Nelco Chemical Lime.

Ultra Modern Equipment Gives Nelco Unusual Merit

Manufacturing chemical lime is a scientific job and nothing less than perfect co-ordination of men, methods and machinery can turn out a perfect product.

The kilns shown above are typical Nelco equipment—the most advanced form known for calcining the limestone. They do the work thoroughly and well—eliminate all possibility of unburned core, dirt or other foreign matter in the finished Nelco product.

Thus the natural high chemical properties of this distinctive *granular* limestone are preserved—from quarry to kiln, constant, painstaking supervision and scientific control of every process.

Nelco Advantages

Distinctive granular form
Unusually high calcium
Native purity
Consistent uniformity
Easy and safe to keep
Prompt shipments of any size
Seven large plants
Thirty year prestige

Nelco Chemical Lime is the only natural granular lime on the market. There is no substitute!

Nelco users know how the resulting chemical activity, purity, uniformity help make their own processes more certain and successful. A trial car will enable you too, to judge its value in action. Analysis and samples on request. No obligation.

NEW ENGLAND LIME CO.
General Offices
Pittsfield, Massachusetts

GRANULAR NELCO HIGH CALCIUM
CHEMICAL LIME

over 99% -through a 200 mesh screen!

Every car of Marblehead is sampled for this fineness test through a 200 mesh screen. It must meet the rigid standards set for "Chemically Pure" Lime.

Almost as fine as a piece of silk is the screen used in the fineness test to which every batch of Marblehead "Chemically Pure" Chemical Lime is subjected. It passes this rigid examination with an almost perfect mark, a fineness of texture grading over 99%.

This convincing evidence of freedom from grit, unburned core and dirt, is but the natural result of the many painstaking precautions in Marblehead manufacture, to insure its purity for the exacting service of grease, oil, paint, rubber, leather manufacture or other chemical processes, or water softening.

It begins with tunneling the quarry for the pure heart of the rock, eliminating the dirt and top rock. Calcining with wood as a fuel, precludes the entrance of coal cinders. After leaving the kilns, the stone is carefully selected to further avoid impurities. Should any even then be present, a comprehensive air-separating system effectively disposes of it.

The Marblehead laboratory takes nothing for granted—it stands as a sentinel over this product to check with chemical analyses and fineness tests, the purity you pay for and get in "Chemically Pure" Chemical Lime.

MARBLEHEAD LIME COMPANY
CHICAGO, ILL.
KANSAS CITY, MO. HANNIBAL, MO.

MARBLEHEAD HIGH CALCIUM CHEMICAL LIME

Combination of service, quality and brand advertising addressed to the large consumers direct

Van Sciver Service scores again!

THE VAN SCIVER CORPORATION SERVICE

Months Ahead of Schedule

REMARKABLE progress has been made on the concrete construction in the two sections of the Broad Street Subway extending from Stiles to Courtland Streets. Both contractors should be highly commended for their splendid efforts.

Each of the concrete-mixing plants, pictured, was especially designed and constructed by the contractors to turn out the maximum yardage of concrete.

Concrete sand and graded gravel are served to these batch plants, day and night, without interruption by a section of the Van Sciver fleet of heavy duty motor trucks.

BROAD STREET SUBWAY CONTRACT 10(3) PARSONS-GOVERN, INC. NEW YORK

The Keystone State Construction Co. and Patrick McGovern, Inc., the firms holding these contracts, selected Van Sciver Service for its dependability, when concrete sand and graded gravel were required in vast quantities.

Van Sciver Service, in the minds of contractors and builders, means first quality materials promptly delivered.

THE VAN SCIVER CORPORATION

Executive Offices:
The Parkway at 24th Street, Philadelphia

WHARVES AND WAREHOUSES
Piers 66-67 North Delaware River
Schuylkill River at 24th and The Parkway
Christian Street and Schuylkill River
Schuylkill River at 30th and Chestnut Sts.

PLANTS
Van Sciver, Pa. Morrisville, Pa. Knickerbocker Pa.

BROADWAY SUBWAY CONTRACT 10(3) KEYSTONE STATE CONSTRUCTION CO. PHILADELPHIA

THE VAN SCIVER CORPORATION

Contractors' and Builders' Supplies

STONE When You Want It

CRUSHED LIMESTONE PRODUCTS

Suitable for Foundations, Bridges and all State Highway Work

Other Bethlehem Products for Highway include:

Concrete Re-inforcing Bars
Lackawanna Steel Sheet Piling
Anchor and Bridge Plates
Rock Drill Steel

Send us your inquiries. Prompt shipments can be made

Stone products from our quarries have been approved for use in concrete, waterbound and penetration Macadam roads. Stone from the Steelton quarry is carefully selected and dry screened to all commercial sizes.

Stone from Bethlehem quarry is thoroughly washed and screened to all commercial sizes.

SAND

Bethlehem quarry also produces a washed limestone sand suitable for heavy foundations and all reinforced concrete where great strength is required. This sand has 75 per cent greater compressive strength than standard Ottawa sand.

RAILROAD CONNECTIONS—Steelton Quarry: Pennsylvania and Reading Railroads. Bethlehem Quarry: C. R. R. of N. J.
Shipments can also be made by L. & H. R., L. V., and Reading Railroads.

BETHLEHEM MINES CORPORATION, *General Offices:* Bethlehem, Pa.
New York Office: 20 Broadway Philadelphia Office: Widener Building

BETHLEHEM

Trap Rock Storage

¶ This stock of all sizes stands behind our promises and makes prompt shipment certain.

¶ Service by eliminating expensive delays has a positive cash value.

BIRDSBORO STONE COMPANY
1004 Land Title Building, PHILADELPHIA

Quality - *Service* - *Price*

CRUSHED STONE

For Good Roads
For Railroad Ballast
For Good Concrete Cor
For Good Highways

Large output
Good service
Prompt shipments via al

Address:
BUFFALO CEMEN
QUARRY OPERAT

Office:
110 Franklin Street,
BUFFALO, N. Y.

Telephones—Seneca 0814 and 0815 Tel

"GRAVEL For CONCRETE"

Concrete and Asphalt Sand: Gravel: All Sizes

Guaranteed to meet State and County Specifications

WASHING PLANTS AT

Franklinville, N. Y.	Daily Capacity	2500	tons or	50	cars
Attica, N. Y.	"	1500	" "	30	"
Total	"	4000	" "	80	"

Shipping via Erie, N. Y. C., Penn., A. & A. and B. R. & P. Railroads

Service—Quality

J. E. Carroll Sand Company
811-815-818 Wide Building BUFFALO, N. Y.

MEMBER NATIONAL SAND AND GRAVEL ASSOCIATION

Service and quality type of advertising—lower right-hand corner are examples of directory advertising

mail-order advertising—as having no application in the rock products industries, advertising copy as illustrated by the examples shown may be divided into four general types or classes: (1) Institutional; (2) Brand—popularizing—consumer preference; (3) Service and quality; (4) Directory. All of the following examples are in one, or more than one, of these four classes.

Institutional Advertising—This class of advertising copy aims at the creation of prestige and good will. Little or nothing is said about selling. It is of a general educational nature, both in text and illustration. A splendid example is some of the recent copy of the Lehigh Portland Cement Co. reproduced herewith. This copy has been used in both the technical journals and the popular magazines.

A good example of collective institutional advertising is the series of 12 advertisements of the Illinois Sand and Gravel Association. This copy is almost wholly of a general educational nature, worded to be understood by the non-technical reader.

Brand Advertising—The chief purposes of brand advertising are to create prestige and consumer preference—to identify desirable qualities and service with the product of the advertiser by direct linking of copy with a prominent display of the brand name. This form of advertising is particularly necessary when sales are made through dealers. Well advertised brands are naturally sought by dealers because of the prestige that comes to them through handling such brands.

Brand advertising and educational advertising are often used together, especially where the consumer is addressed directly, as in the four examples of chemical lime advertising, herewith.

Quality and Service—Advertising a more or less standardized commodity, such as all the rock products are, quality and service are very real selling arguments. The chemical lime advertisements, already referred to, also introduce this factor, but the best examples are the first three sand, gravel and crushed stone advertisements on the succeeding page; also the two examples of glass-sand advertising—the one emphasizing service, the other quality.

Directory Advertising—The two lower right-hand advertisements of sand, gravel and crushed stone are ordinary examples of directory advertising. They do little more than give directory service—a place where the consumer may find the commodities listed, and the addresses of the producers. Little should be expected of such advertisements except mere directory service.

The Intangibles of Advertising

When prestige and good will have been accumulated some advertisers believe they can maintain them, for a time at least, by directory advertising. It is practically valueless to unknown or little known producers and manufacturers, unless published in an industrial directory, pure and simple.

From the foregoing it should be clear that the biggest values in advertising are indirect, intangible, or immeasurable. These immeasurables are admirably summed up in an article in *Printers' Ink* for December 31 by Henry Eckhardt as follows: (1) The readers' unconscious absorption of ideas; (2) under-surface sales—the sales that can not be traced, but nevertheless are the direct result of advertisements read and impressions created, even though the buyer has no recollection of how the impression was created; (3) reselling the ownership of a product—that is keeping the owner, or buyer satisfied with his purchase by continually reminding him of its virtues, or the service rendered—a very important function of advertising; (4) salesmanship which makes sales for competitors—the sales lost through lack of adequate follow-up by personal salesmanship or by poor personal salesmanship; (5) the consumers who "intend to"—the lag between the desire to buy and the actual purchase—not such an important factor, perhaps to rock products producers, but one that must be considered if you wish to get full value from an extensive advertising campaign; that is utilizing the cumulative value in consistent advertising; (6) the

MICH.
N. Y.
IND.
OHIO
PA.
N. J.
W. VA.
VA.
KY.
N. C.
S. C.
TENN.
ATLANTIC OCEAN
★ OUR PLANTS
Our plants noted on the map by a star are located at the following places and served by the railway system shown.
Mill Creek, Pa.
Mapleton, Pa.
Vineyard, Pa.
Ryde, Pa.
Granville, Pa.
Pennsylvania System
Mancos, W. Va.
Berkeley Springs, W. Va.
Baltimore & Ohio Railroad
Keyser, Va.
Chesapeake Railroad
Newport, N. J.
Central Railroad of New Jersey
Facilities for Service
THE LOCATION of our plants is of special significance to users of glass sand. Continuity of shipments despite local transportation difficulties is made possible with shipping facilities on several trunk line railway systems.
The map above shows graphically the advantageous distribution of our plants in relation to the principal centers of glass manufacture. We are thus enabled to offer the Glass Industry a service of signal individuality based on uninterrupted shipments, lowest competitive transportation costs and uniform sources of supply.
PGS Co.
PENNSYLVANIA GLASS SAND CO.
LEWISTOWN, PENNSYLVANIA
SALES OFFICE: 323 FOURTH AVENUE, PITTSBURGH, PA.
The SAND Factor in Plate Glass Making
99-99½% SiO2
EVEN
GUARANTEED MESH
GLASS-SAND
MELT
U.S. Silica Co. Chicago
"Table 10" displayed in the center of this page is part of a recent Report of the U. S. Tariff Commission, in its investigation of the cost of producing plate glass in the United States as compared with Belgium, Germany, and other foreign countries.
The fact that batch material costs represent only 10.78% of the total cost of making plate glass emphasizes the small importance of any "saving" which can be accomplished by sharp buying tactics in batch commodities, if a lower price carries with it any risk of lower quality.
TABLE 10
United States: Range of principal elements of cost per square foot of Polished Plate Glass, First Quarter 1923. (Seven companies reporting.)
Items | Average Cost | Per Cent
Direct material | $0 04963 | 10 78
Labor | 12870 | 27 96
Fuel and power | 08006 | 17 38
Supplies | 06429 | 13 97
Other factory expense | 10080 | 21 89
Administrative | 03184 | 6 92
Total manufacturing and administrative | 45532 | 98 91
Selling | 00500 | 1 09
Grand Total | 46032 | 100 00
Glass Sand, for instance, at present low prices can represent no more than a third of the average batch-material costs—or, say 4% of the total. The buyer who accepts a dusty sand, or one foul with iron oxide, to "save" even 25% of this 4% is risking a dollar's worth of product to save a penny in his sand bill.
EVENMELT
Guaranteed-Mesh Glass Sand is actually the cheapest sand you can buy, if you will include ALL costs in the buying equation.
Its mesh-guarantee (within 28 to 70 screen limits) means freedom from both dust and oversize grains. This reduces seed trouble, minimizes all other physical defects; and one customer reports a 20% saving in melting time and fuel-cost (see third item in table).
Its freedom from iron oxide guaranteed to run below .025% means clearer glass—salable at higher prices.
Every plate glass manufacturer who thinks more of 99c than he does of 1c is invited to accept our
Liberal Trial Offer
We will ship a sufficient tonnage of EVENMELT for a thorough working test. You pay the freight from Ottawa, Ill., and after the tests are completed, pay us for the sand, your estimate of its value to you compared with present market price on the sand you have been using.
99-99½% SiO2
EVEN
GUARANTEED MESH
GLASS-SAND
MELT
U.S. Silica Co. Chicago
Makers of other types of glass
can also find food for thought in this page. The above free trial offer is open to all.
UNITED STATES SILICA Co.
122 South Michigan Ave. Chicago

Fine examples of service and qualty adverti sing—left, service emphasized; right, quality

value of continuity—"persistent pounding, pounding, pounding"—you can never be sure of putting over even a single idea in one advertisement; (7) good will, reputation, or whatever you choose to call it; it has a real sales value, as witness the Dodge Bros. motor car company and the National Cash Register Co. deals; (8) education; (9) atmosphere—creating a favorable reception for the salesman when he makes his call.

Mediums for Rock Products Advertising

Most advertising by rock products producers naturally belongs in the engineering and construction journals—serving the engineer-contractor consumer direct. The Lehigh Portland Cement Co. and some of the others are using the popular magazines as well, for the institutional, educational type of advertising. This, of course, is the most expensive kind of advertising and can not be indulged in by the rank and file of producers, except on a co-operative basis. It is the least tangible of any form of advertising and the advertiser has to be pretty well educated in advertising "to see it."

For purely educational advertising, designed to be read by the ultimate consumer, the daily or weekly newspapers are the logical medium. The Illinois Sand and Gravel Association members are much pleased with their 1925 campaign in the small-town newspapers of the state, and this campaign will be continued on a larger scale in 1926. The use of the large city dailies for anything like a consistent campaign is prohibitive in cost, and the actual consumer is much more rare among the readers than in the case of the country press.

Local construction, or contractor, journals are most used by crushed stone, sand, gravel and slag producers in reaching the contractor purchaser direct. In such mediums, of course, general educational copy is of no value, and emphasis must be laid on service—the one thing next to price which interests the contractor.

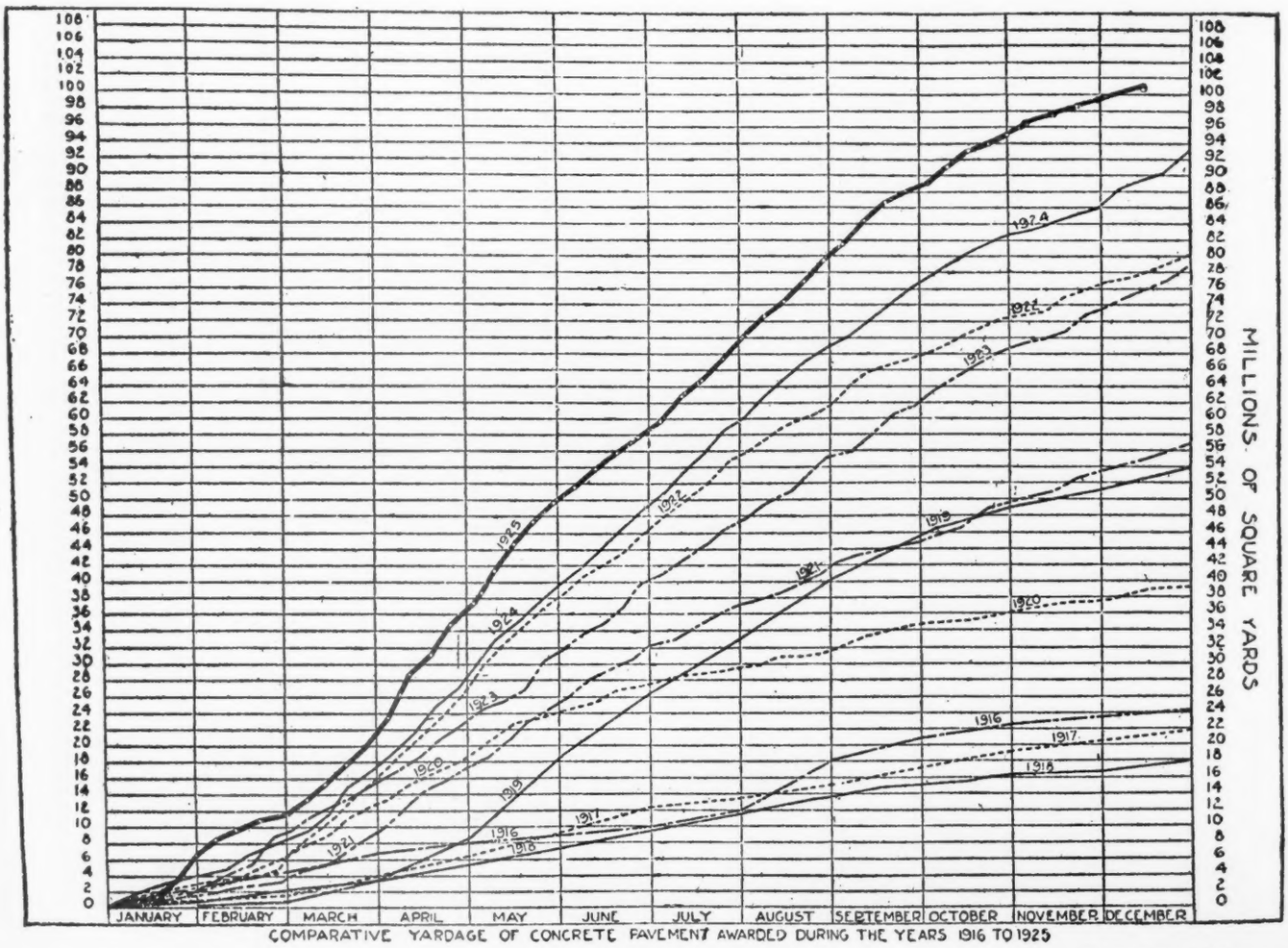
Journals appealing to building supply and construction materials dealers, of course, must be used to establish brand names and prestige. Usually such advertising must be strengthened by co-operation with the dealer in local consumer advertising, or by a national campaign in popular mediums designed to reach the consumer. The dealer is usually merely looking for something that will move at a profit—either quickly at a small profit, or if more slowly, at a greater profit, and his allegiance to any one brand is not very great.

The very fact that the volume of rock products advertising is so large, and is increasing, is the best proof possible of the increasing stability of the rock products industries, and of the increasing appreciation of modern business methods by the rank and file of producers. We look to see a great deal more of co-operative, educational advertising, as well as more and more use of local newspapers and construction journals by rock products manufacturers.

Over 8500 Miles of Concrete Pavement Built in 1925

ACCORDING to figures from the *Chicago Journal of Commerce*, new concrete pavement to the extent of 8500 miles is estimated to have been added to the total in the country during 1925 as the result of the year's construction activities. Of the total, 6372 miles are 18-ft. highways and 2128 miles are 30-ft. city streets and 18-ft. alleys.

The statistics show further that 11 states had awarded contracts for over 1,000,000 sq. yd. of concrete during the first 10 months of the year. The total contracted for amounted to about 72% of the entire concrete pavement to be built for the year. More than 1000 cities paved with concrete the past year.



COMPARATIVE YARDAGE OF CONCRETE PAVEMENT AWARDED DURING THE YEARS 1916 TO 1925

Chicago Journal of Commerce

United Fuel and Supply Company, Detroit, Buys a New Plant and Shipping Line

The Birmingham Sand and Gravel Company's Plant at Detroit Sold by Receiver for Reported Price of $1,000,000

THE Birmingham Sand and Gravel Co., of Detroit, Mich., has recently been sold to C. N. Ray, as president of the United Fuel and Supply Co. of Detroit. The Detroit Steamship Corp. was also acquired, giving the United Fuel and Supply Co. unequaled facilities for the receipt and delivery of crushed stone and sand and gravel in Detroit, for the material handling and delivery yard of the Birmingham company is one of the finest in the United States. It was erected last year at a reported cost of $443,000.

The plant is located at the foot of West Grand River boulevard, which is practically in the heart of the city at the river. All materials are shipped in by boat, the stone coming from three ports, Sturgeon Bay, Wis., Calcite and Rogers City, Mich. Materials come to the plant in both bulk freighters and self-unloading vessels, so that a plant of flexibility had to be designed.

The major piece of equipment is a gantry crane, specially designed by E. J. Crowells, and built to special order by the McMyler Interstate Co. It has a span of 30 ft., is 36 ft. high, and has a 70-ft. boom. Its main hoisting engine is powered by a 150-hp. motor and its swinging engine, which also controls the travelling mechanism, is powered by a 35-hp. motor. The clamshell bucket is of 5-yd. capacity and is capable of delivering 700 tons per hour to the conveyor, either from a bulk freighter or from storage.

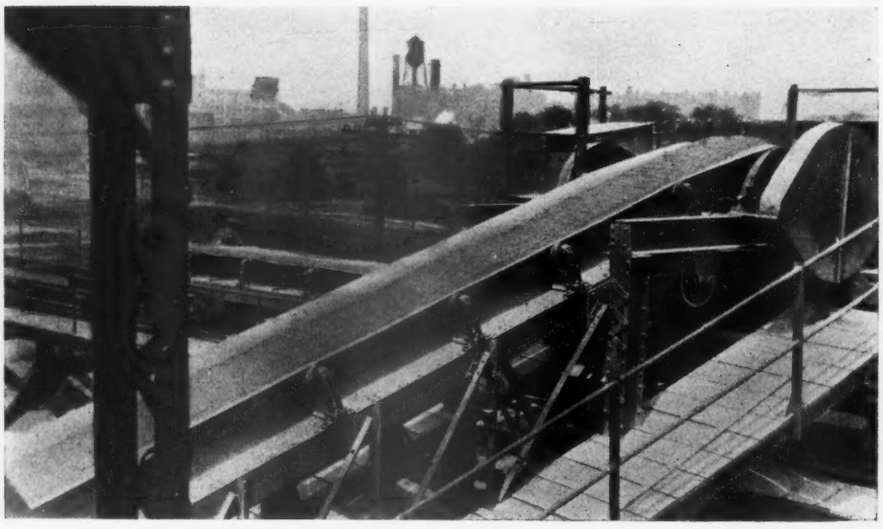
A traveling hopper of 50-yd. capacity for feeding the main conveyor travels with the crane, although it can be operated independently. This hopper discharges on a 42-in. belt conveyor of 350-ft. centers, extending from the river end of the crane runway to an inclined belt conveyor leading to the loading bins. The inclined belt discharges on a third 42-in. belt of 75-ft. centers which is a reversible shuttle conveyor serving the six steel bins, of 250 yd. capacity each. This shuttle, of course, does not travel laterally.

The main conveyor is equipped with a

View from the top of the storage bins of the gantry crane and traveling hopper over the conveyor belt

Bins of the Birmingham Sand and Gravel Co. plant at Detroit, Mich. Each holds 250 yd., making 1500 yd. for the whole. The portable stacker behind builds stockpiles for additional storage

The shuttle conveyor discharging into one of the bins



Inclined conveyor leading from the main belt to the shuttle conveyor

This shows the parabolic design of the storage bins and the supporting frame of the shuttle conveyor

travelling tripper serving stackers, so that when the bins are full, materials can be deposited in the outside storage, the total capacity of which is 150,000 tons. The travelling stacker extends on either side of the crane runway, its belts being 42 in. wide, of 60-ft. centers. The tripper is designed so that half or any part of the main belt's load can be diverted to outside storage while the remainder continues to the steel bins. Materials are rehandled from storage by the crane in the same manner as the unloading of boats.

From an engineering standpoint the plant is an especially notable achievement. Considering that six different sizes are handled; that boats can be unloaded and the material sent directly to either truck loading bins or storage; that the unloading of a boat does not interfere with the normal operation of the plant, the plant's design is noteworthy.

Variety of Products

Materials handled include practically every size in demand in Detroit. These are: Mason sand, torpedo sand, "60-40" mixed stone and sand, 2-in. stone, 1-in. stone and 1¼x

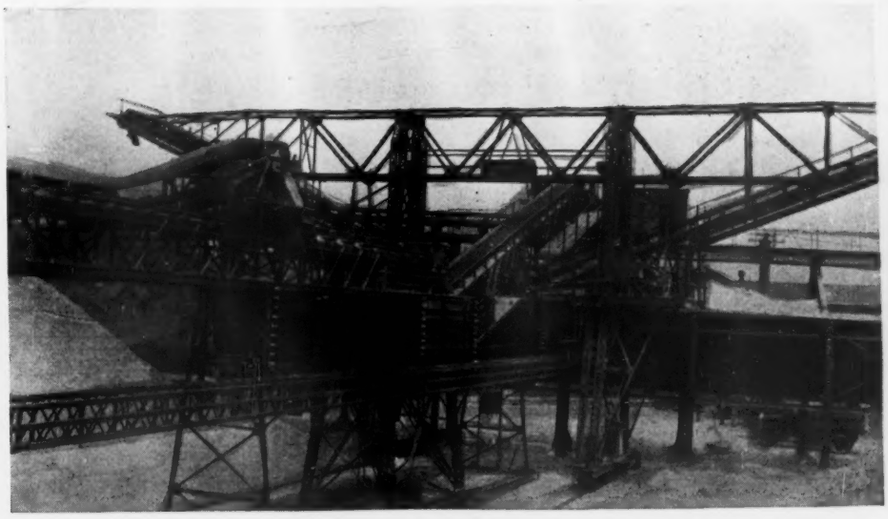
The gantry crane loading into the traveling hopper

1½-in. "Calcite." A fleet of 24 Gotfredson, 18 Mack and 12 Packard trucks of 5 and 7 yd. capacity take care of the deliveries. The most surprising feature of the plant is that but four men are required to operate it at its maximum capacity of 7000 tons per day of 10 hours. Another surprising feature is that there are a total of only nine electric motors required to drive the network of

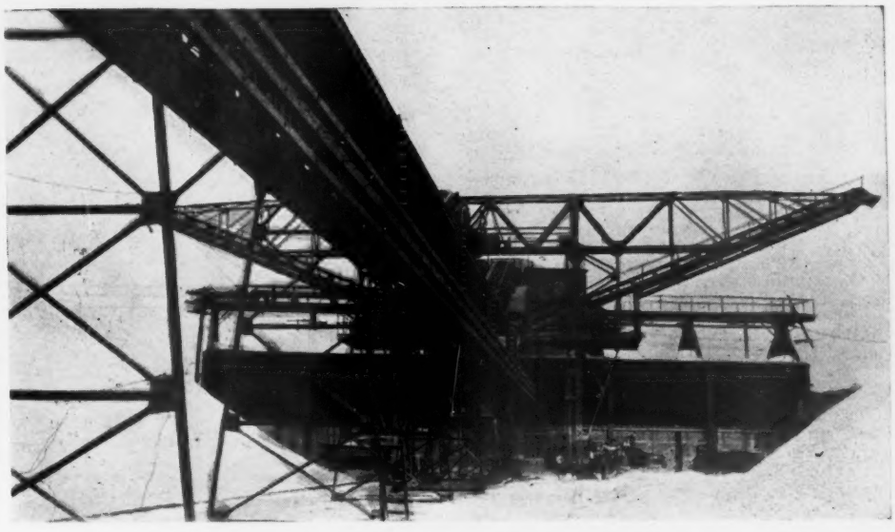
belts and the crane machinery. These were furnished by the General Electric Co. The conveyors were furnished by the Stephens-Adamson Co. and the belts themselves by the U. S. Rubber and Belting Co. The Russell Wheel and Foundry Co. supplied the steel bins.

The 5-yd. bucket reclaiming stone from a stockpile

The United Fuel and Supply Co. is a large producer of crushed stone and sand and gravel, and its plant at Oxford, Mich., is one of the largest in that well-known district. The Detroit Steamship Corp. has three boats and it was considered a subsidiary of the Birmingham company. The Detroit newspapers report that the sale of these companies was a cash transaction involving more than $1,000,000.



This shows the center conveyor, the shuttle conveyor, and the two stacking conveyors. All have 42-in. belts with centers from 60 to 350 ft.



This shows the relative position of the tripper, the stacker, and the bins

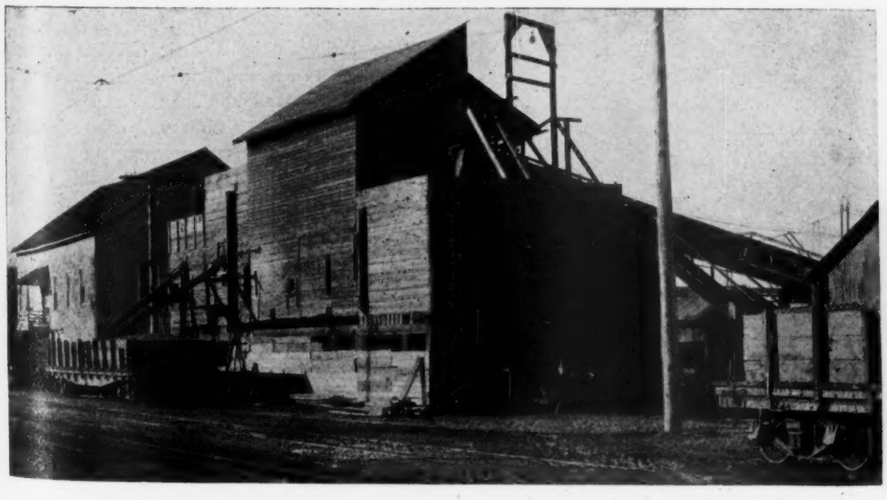
A Well-Managed Oregon Sand and Gravel Company

ONE of the corporations that is contributing considerably to the convenience of road building and concrete construction in the northwest section of Oregon is the Albany Sand and Gravel Co., which is located at the foot of Broadalbin street.

This company furnishes the sand and gravel used on many roads in the locality. A large stock of both is carried in this company's large storage department. The sand and gravel of excellent grades is taken from the Willamette river and it has been found that in quality both sand and gravel from this source have met the highest specifications, according to Engineer Chase of the state highway department. This company is also engaged in the manufacture and handling of all kinds of cement building materials, building blocks, face brick, etc.

J. J. Lindgren, manager of the company, has had a long experience in the sand and gravel business and has been associated with the company since 1913, when he bought the interest of J. W. Billings, who, with H. C. Harkness and Hugh Fisher, had established the company the year before. The latter two eventually sold out and now the entire company is in the hands of Robert Sellers, who is now president, and Mr. Lindgren, secretary-treasurer.

The plant property has been extensively improved and at present alterations on the store room and office are in progress.—*Albany (Ore.) Democrat-Herald.*



Plant of the Albany Sand and Gravel Co., Albany, Ore.

Hints and Helps for Superintendents

Preventing Fires in Coal Pile*

By Inspection Department, Associated Factory Mutual Fire Insurance Companies

COAL-PILE fires almost continuously for twenty years and now no fires for twenty-one months! From a shrinkage of 10 to 15% to no loss whatever in a 10,000-ton pile! This was the result of adopting the packing and rolling method of piling coal at the Utica Gas and Electric Co., Utica, N. Y. No change whatever has been made in the quality of coal purchased. It contains from 68 to 70% of carbon, from 1 to 1.45% sulphur, and has a heating value of 13.250 to 14,500 B.t.u.'s.

The accompanying pictures show the coal pile and the method of piling. The coal is dropped from a bucket crane in layers about three feet deep, and is then smoothed and packed down by a caterpillar tractor hauling an ordinary road drag. The coal is tamped down with a mallet around posts or other projections extending up through the pile. Successive layers are then added in a similar manner until the coal reaches a height of 15 or 20 ft. This may be increased to 30 ft. where storage space is limited.

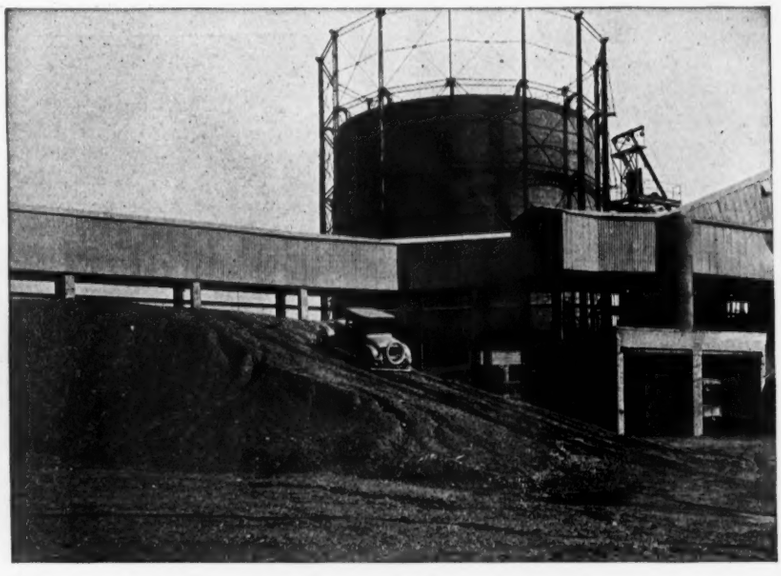
The principle is to pack the coal tightly and exclude the air. As shown in the picture the surface of the pile is so hard that an automobile can be driven up on it. The caterpillar tractor weighs about 3800 lb. and is economical to operate. The cost of leveling and rolling is about six cents per ton. The increase in storage capacity is approximately 30%.

Certain of the poorer grades of coal heat so readily that some plants have provided storage space under water. Even the better grades will heat and burn if not properly stored. Thermometers located in test pipes will serve to indicate the existence of fire, but any attempt to extinguish it with water will generally prove useless unless the coal is removed from the pile. This is costly, both in the loss of the coal itself and in the labor involved in uncovering and removing the portion which is on fire. This feature makes the problem particularly serious when the coal must be stored for a year or more.

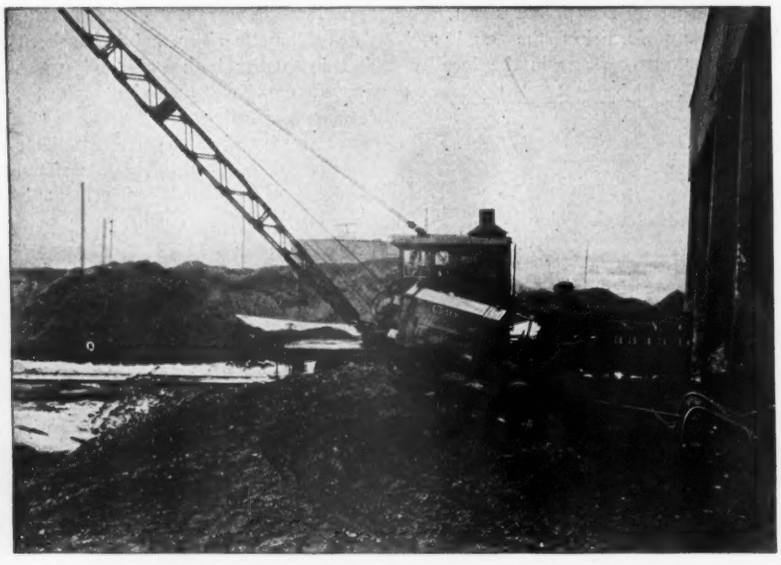
When coal is stacked wholly by means of a crane, the lumps roll down the sides of the pile to the ground and form the bottom layer. The spaces between the lumps permit the access of air so necessary for spontaneous ignition. It is a well-established fact that the absorption of oxygen by piled coal produces heating and subsequent fire. The problem, then, is to exclude the oxygen as far as possible. The very best results would be obtained with fine coal free from lumps, but even with coal of various sizes, if it is of fairly good grade, the packing process will practically eliminate the possibility of spontaneous ignition.

The Philadelphia Electric Co. has stored 200,000 tons of a great variety of bituminous coals by this method during the past three years and has had no fires, even though the pile when full is approximately 100 ft. wide and 30 ft. high. The coal at this plant is spread by a locomotive crane in layers about two feet thick and leveled with a caterpillar tractor dragging a heavy roller. This is continued until the desired height is obtained. Finally, the pile is trimmed by having the crane remove the loose coal from along the bottom edges and place it on the top of the pile. The coal is packed so tightly that it sheds water. A series of observations indicates that there is no circulation of air through the pile and that the temperature of the interior is safe, as the circulation of air is the cause of fires.

*Reprinted by permission from Factory Mutual Record.



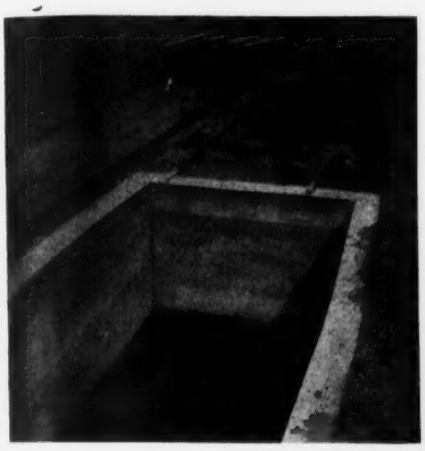
Storage by the rolling and packing process. The surface is hard enough to permit an auto to be driven over it



The method of smoothing and packing a coal pile. Note the caterpillar tractor used for this purpose

A Car Dipping Tank

THIS is a "hint" from the cement products field. The cars used around block plants rust rapidly owing to the dampness and the effect of the cement drying on them. For this reason the cars are protected both by painting with red lead and by being kept well-oiled.



Oil tank in which cement block trucks are used

Putting oil on cars with a brush is a dirty and tedious job. At the plant of the Omaha Cast Stone Co., Omaha, Neb., the work is simplified by dipping the cars in a bath of oil. After dipping, the car is raised above the tank and two sticks are put across the tank to hold it. This gives it a chance to drain thoroughly so that no oil is wasted. The picture shows the concrete tank and the track for running the car to its edge.

Increasing the Output of a Rotary Screen

By C. G. KNOBLAUCH,
Superintendent, J. C. Stewart Co.,
Owosso, Mich.

AT the J. C. Stewart Co. plant at Oxford, Mich., this last season, it was found in using semi-trunion cylindrical screens that a good deal of the gravel size from 1 to 1½ in. was carried over on the 2½ in. section, reducing considerably the amount of commercial material of the small size and causing expensive waste.

The screen had been installed in such a way that it was impossible to change the pitch and speed and even if this had been possible, it would have affected the rest of the sections, which were working satisfactorily.

To overcome this, a 1¼-in. steel wire rope, which was discarded from the slack line installation, was wound spirally on the inside of the 1½-in. section, the spirals going against the direction of the rotation of the screen.

This increased the screen area by at least one-third, which was caused by the material carrying up further on the side of the screen as the screen revolved. Incidentally the rope served as a baffle, retarding the forward motion of the material.

The rope was held in place by heavy wire fastened through the perforations on the screen, and once installed lasted throughout the season.

The percentage of the 1½-in. material which was formerly discharged into the 2½-in. material was reduced from 40% to 5%.

A Handy Shop Contrivance

THE frame of angles and channels shown here has many uses in the repair shop. In the upper part of the frame

A handy contrivance for forcing bearings from a motor

is mounted a long screw with the nut in a hand wheel, and by turning this wheel

The same machine used as a mounting for a drill press

considerable downward pressure may be exerted. It can be used to hold parts while work is being done on them, it takes the place of a press in forcing out motor bearings, as is shown in one of the pictures, and used as a mounting for an electric drill (also shown), it can be used in place of a drill press.

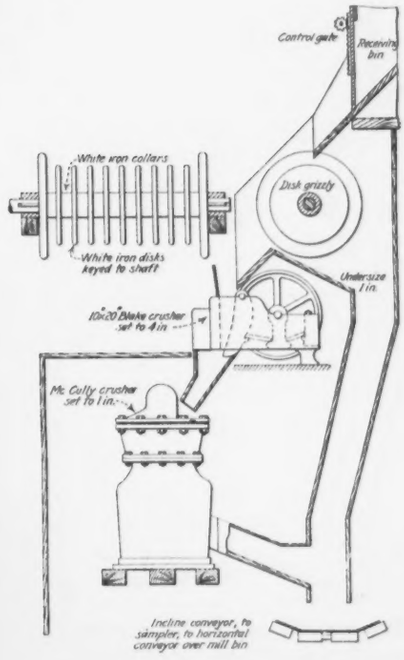
This contrivance is in use in the repair shop of the Southwestern Portland Cement Co. at El Paso, Texas. It was devised by H. S. Sparks, the chief electrician of the plant.

A Neat Arrangement of Rock Crushers

THE cut, which is from the *Engineering and Mining Journal-Press,* shows a neat arrangement of grizzly and coarse and fine crusher which might be incorporated in crushed stone plants. It is taken from a description of the West End cyanide plant at Tonopah, Nev., where it is used to crush silver ore.

The use of the disk grizzly is not common in stone crushing plants but it has been used in them with some success. In this case it is made of chilled white iron which wears well and is cheap to use, especially when scrap is returned to a local foundry.

The cut lacks one necessary feature which


Control gate
Receiving bin
White iron collars
Disk grizzly
White iron disks keyed to shaft
Undersize 1 in.
10x20 Blake crusher set to 4 in.
Mc Cully crusher set to 1 in.
Incline conveyor, to sampler, to horizontal conveyor over mill bin

A neat arrangement of a disk grizzly and two crushers

is a chute for feeding the conveyor with the undersize that goes through the grizzly and the crusher product. It would certainly damage the belt to allow the undersize to fall upon it from such a height. A chute turned in the direction in which the belt was running would break the fall and feed the material to the belt without injury.

A Survey of Sand and Gravel Resources

Ample for the Present but Shortages Are Developing

By Edmund Shaw
Editor, Rock Products

IN 1911, the earliest year for which the writer has the figures of the Geological Survey of the United States, there was produced 66,846,959 short tons of sand and gravel valued at $21,158,583. In 1923, the latest year for which the figures from the same source are available, the production had risen to 139,923,153 short tons with a value of $90,903,654. The 1924 estimate of the Geological Survey has been placed at 156,527,967 tons and, as explained in our Dec. 26 issue, the production for 1925 is estimated by ROCK PRODUCTS to be 170,000,000 tons. Sand and gravel deposits vary so much in depth that it is difficult to estimate what such a tonnage means in acreage. But the very deep deposits of both coasts may be offset by the shallower deposits worked in in the south and central states so that it is probable that 40,000 tons to the acre is not so far from the actual recovery. Hence, at the present rate, we are depleting our sand and gravel reserves at the rate of more than 4000 acres per year and the rate is expected to increase yearly.

This appears to be a mere flea bite when it is compared with the great acreage of sand and gravel land known to exist. But it must be remembered that only a very small part of the land which contains sand and gravel really constitutes commercial deposits. Transportation facilities must be available. It is not uncommon to find the price of sand and gravel delivered on the job to be four times the plant price. Hence any serious difference in transportation cost will make one deposit available but not another, which is of quite as good material and is perhaps more easily worked.

Quality Is Important

The matter of quality also determines the value of a deposit. There are immense acreages of sand and gravel which contain so much shale, organic matter or other deleterious material as to render them unfit for concrete aggregates. Methods of removing these deleterious materials are known but it is only in occasional instances that the price that can be received for the finished product is sufficient to pay the expense of applying this method. Inferiority therefore cuts out another large part of the acreage.

And in the third place there is the workability of the deposit to be considered. To be worked on a large commercial scale sand and gravel deposits must be of large area and continuous. If they are "patchy" or "pockety," the expense of working them is greatly increased and it is only where the market is exceptionally good that these deposits can be worked at all.

Taking all these things into consideration, it will be seen that the depletion of our sand and gravel deposits is a serious matter. In one mid-western state (Iowa) the highway department has pointed out that what gravel there is in sight should be saved for concrete highway aggregate and not used to build the temporary forms of gravel roadways. In some of the eastern states producers have accumulated as much gravel bearing land as they can buy, and some of the largest of these producers say that they cannot see more than 35 years' supply at the present rate of depletion.

Factors Which May Increase Our Resources

Fortunately, we can predict with some certainty that as the deposits being worked become exhausted a certain amount of new acreage will become available. This will be due first of all to increased transportation facilities, especially to the building of concrete highways, for truck delivery of sand and gravel becomes more and more important each year. As the deposits of better

THIS survey of our sand and gravel resources—largely made from personal observations and from talking with the consumers of different states is necessarily incomplete. But it shows that while resources are ample for the present, another generation will see most of the deposits near our larger centers of population exhausted and some of them will be exhausted before that time. In the towns which depend on river dredging for supplies it becomes necessary to go farther away each year, and to work over parts of the rivers which have been unsystematically dredged perhaps two or three times.

The fact which the editors wish to bring home to the readers is that our sand and gravel deposits are great national assets, and like all mineral deposits, which are being worked, they are dying assets. They should be used intelligently and not be wasted.

Worked out portion of an old stream bed deposit. Note the limestone bluffs exposed by removing the gravel

quality are exhausted the deposits of poorer quality will be drawn upon and the bank material will be processed to remove deleterious materials so that good concrete aggregate may be made of it. This is already being done in a few isolated instances. And, if the price rises, it may be possible to work more of the patchy and pockety deposits at a profit.

These are factors which will partly compensate for the depletion of the deposits being worked at present. But even taking these into account it is impossible for one who has acquainted himself with the sand and gravel industry of the country as a whole to escape the conviction that the time is fast approaching when shortages will begin to develop. They will come locally, of course, and not to the industry as a whole. But the industry as a whole will be affected sufficiently to show a general increase in prices. For the past year or two the tendency has been to slightly lower prices while increasing production. This may go on for a few years longer but in the end there is bound to be a reaction due to the depletion of deposits and the increased cost of putting the material, which must meet increasingly rigid specifications, on the market.

Not so much the producers but the public must be taught that our sand and gravel deposits are great national assets, not to be worked in a haphazard and wasteful manner, but to be drawn upon systematically.

From Bulletin No. 43, Illinois Geological Survey

Glaciated area of North America. The importance of the sand and gravel deposits in this area comes from the fact that more than half the people in the United States live in the states wholly or partly included in the area

Classification of Deposits

The sand and gravel deposits of the United States and Canada may be classified according to their origin as follows:

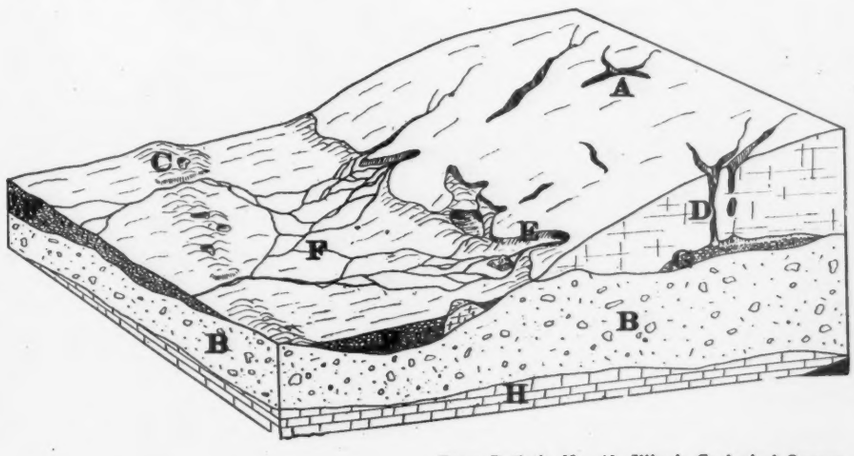
Glacial and Fluvo-Glacial Deposits
Washes of Eroded Material
River Channels and Terraces
Beach Deposits
Aeolean Deposits (Dunes)
Consolidated Deposits (Sandstone and Conglomerates)

Of these the deposits of glacial material are easily of the first importance.

Glacial Deposits

The accompanying map shows the area covered with the glacier of the Pleistocene, or so-called "ice age." It is probably more than a coincidence that the limits of this area also mark the most thickly populated area of the United States. The value of glaciation as an agent for preparing land for agriculture is well enough known, and while transportation and commerce have made it possible for us to live anywhere, so far as food supply is concerned, this was not the case when the country was settled. The fact that the glaciated area is the most thickly settled is one of the reasons why the glacial deposits are of the greatest importance—that is, they are nearest to a market. The other reason is that they are in the main of excellent quality and from their origin they are sufficiently extensive and of such a depth that they can be worked on a large scale.

These deposits are spoken of as glacial and fluvo-glacial; the latter term means that they are composed of glacial materials which have been brought to their present situation by water. In rare instances it may be that original deposits (moraines) of glacial origin are worked for sand and gravel, but the writer knows of no such workings. All commercial deposits that he knows of have been redeposited by water if only the water which came from the melting of the ice.



From Bulletin No. 43, Illinois Geological Survey

Block diagram of the margin of a retreating glacier. A. Glacial ice. B. Ground moraine deposited by glacial ice. C. Ridged drift or marginal moraine abandoned by the retreat of the ice. Similar ridged drift is shown under the edge of the ice. D. Super-glacial streams descending to become sub-glacial. E. Subglacial streams emerging from tunnel; a situation where kames are formed. F. Outwash plains deposited by heavily loaded fluvo-glacial streams. G. Fluvo-glacial deposits under the ice. H. Bed rock.

Geologists have given names to certain forms of deposits which were made by melting glaciers, such as kames, which are mounds formed by streams flowing out from the edge of the ice sheet, and washing material from the moraines before it, and eskers, which were formed by streams flowing underneath the ice and forming deposits which now exist as long and narrow mounds. In some cases these streams under the ice broke through to the surface and spouted like geysers, building hills of considerable height around the outlet. This form is quite a common source of sand and gravel in New York state. Kames and eskers are also worked for sand and gravel in the middle western states.

The building of kames and eskers concentrated the sand and gravel by removing the clay (produced by the grinding action of the rocks as the moraines were formed). Hence the gravel and sand composing them was originally clean from being well washed. But in the process of time, clay was brought in by rains and some clay was formed from the decomposition of the pebbles *in situ*. For this reason almost all glacial materials have to be washed, although occasionally one finds a deposit in which the sand and gravel is almost as clean as though it had been put through a washing plant.

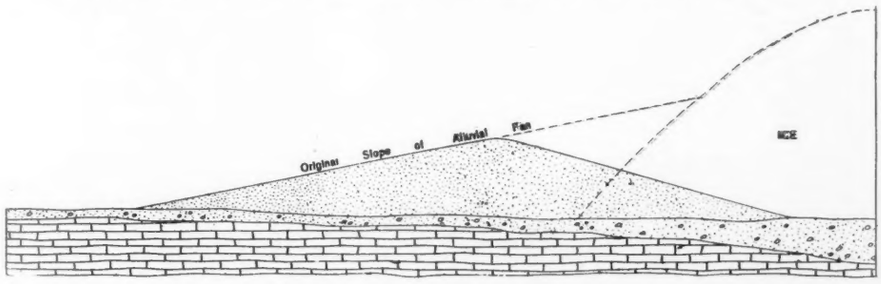
Glacial Materials Moved by Water

A second and perhaps more important class of deposits which owes its existence to glaciation is made up of those deposits which have come some distance from the places in which the glaciers left them. The distance which sand and gravel will travel through the effect of floods, torrential rains, and in river channels is almost unbelievable. Glacial material has been identified hundreds of miles south of the southernmost limit of the glaciated area. In some cases it has been in sufficient quantity to be worked commercially. There are said to be examples of such workings in Arkansas and southern Missouri.

The most important examples of this sort are the outwash basins and the stratified alluvial deposits which are found throughout the glaciated area. It is to this class that the deposits on the north shore of Long Island, the deposits near Boston, the Tullytown deposits near Philadelphia, and most of the deposits at Indianapolis and along the Wabash valley, those north of Detroit and at other points in the middle west belong. These are the main sources of sand and gravel supply for our largest cities and, fortunately, they are sufficiently large and of such great depth that their exhaustion will not come for many years except in a few localities.

Perhaps the finest fluvo-glacial deposits found in the country are those near Seattle, Wash. They are of great depth and extent and of the high quality. Some of them are 300 ft. deep.

Washes of eroded material occur on the Pacific coast, especially in southern California. Here deep valleys have been filled with the material eroded from the mountains near by and the process is still going on. These mountains are composed of igneous rocks, granites, andesites and the like and they are constantly breaking up on the surface through the action of heat and cold and other agencies. When heavy rains come the products of this breaking up are carried down into the valleys, forming what are locally known as "washes." These "washes" are mixtures of boulders, gravel and sand in varying proportions. The Big Tejunga wash and the San Gabriel wash near Los Angeles are good examples. Each of these has produced millions of tons of building material for the towns and cities of southern California and production is going on at an increased rate. But they will not be exhausted soon, as they are very large and in some places known to be 400 ft. deep.



From Bulletin No. 43, Illinois Geological Survey

Diagramatic section of Big Mound, Ill. Probable relationship of the gravel deposit to the margin of the ice sheet at time of formation is shown. Slope wash subsequent to the disappearance of the ice has produced the face on the side toward the ice. This form of deposit is called a kame.

Stream Sands and Gravels

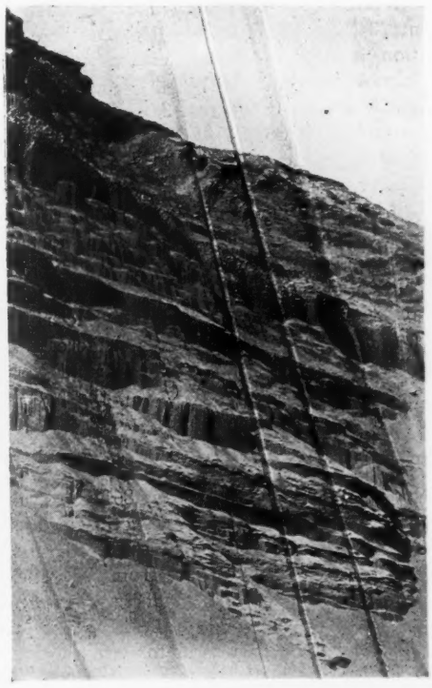
The beds of many rivers are dredged for both sand and gravel and some of them have been dredged to such an extent that commercial working is no longer possible. The Delaware is an example of a river that is practically exhausted. The Ohio, Mississippi, Missouri and tributaries are examples of rivers whose beds still yield enormously. About 6,000,000 tons per year are taken from the three rivers at Pittsburgh.

Old river channels yield a great deal of material in the central, south and southeastern states and also in the west. These are sometimes found where swift tributaries debouched into the larger and more graded streams of the section. In other cases they exist as old river terraces. They are usually smaller in extent than the glacial deposits and the material in them varies from the best to about the poorest that can be used. This is due both to the differences in the rocks from which they were formed and their age. Some of the deposits in the south consist almost wholly of flints that have been washed out of soft limestones, and these make excellent concrete aggregate. Some

Gravel (shingle) from an old beach now a commercial sand and gravel deposit

of the river sands in Tennessee are almost pure silica.

Many of the old stream deposits are comparable to the washes just described, but they have been modified by solution and other agencies which have removed the softer and more soluble rocks. Thus the quality is improved. In some other cases there has been a partial cementing of the sand and pebbles which makes the material so difficult to excavate and wash



Where an esker has been worked, the lines of seasonal flows can be seen

that the deposits are almost valueless for present working. But it may be predicted that many of these old stream deposits that will produce commercial material will eventually be worked, as they are often found in localities in which towns and cities are growing, highways are being built and aggregates are much in demand.

Beach Deposits

What has just been said of old stream deposits applies to the (geologically) old beach deposits which are an important source of sand and gravel in some parts of the country. They seem to be closely connected with old stream channels (as deltas) on one hand and with the aeolian deposits on the other. Thus, according to one authority, the silica sands of Illinois were laid down as sand beaches of the sea of Ordovician time which occupied a part of the present Mississippi valley. Afterward these beach sands were blown into dunes and thus sorted so that the grains are very well sized and the deposits are quite free from any foreign matter.

Modern beaches are worked for sand and gravel to some extent. Some beaches on the New England coast have produced in commercial quantities, although usually beach sands are too fine except for some of the minor uses of sand, such as polishing slate and glass and some sorts of plastering which require fine sand.

Old beaches on the Great Lakes which were formed when the lakes stood at a higher level than they do today are worked for both sand and gravel but especially for sand.

The bottoms of bays and other shallow waters near the coast in many places contain workable deposits of sand and gravel and they are dredged near New York, Baltimore and other places. These deposits might be considered as extensions of beaches since they are formed of the same material, the products of erosion brought down by rivers.

Aeolian Deposits

Aeolian deposits were formerly considered of little value, but they are important in production today. Perhaps the largest working of such deposits is to be found on the shores of the Great Lakes. The dune sands are too fine for concrete aggregate, but they are used for plastering and asphalt sand, and as they are high in silica, they serve in the place of the more expensive glass sands for the making of the cheaper sorts of glass, for steel casting and for furnace lining.

In the neighborhood of several cities small deposits of "blow sand" are worked for asphalt sand. These are fine sands, usually blown from river bars or beaches, and so sorted by the wind so that the grains are all fine and of nearly the same size.

Deposits of Consolidated Material

Sandstones and conglomerates are the great source of glass sand and refractory materials and they are worked in several parts of the United States. For such purposes they must be composed of almost pure silica grains so that the impurities, in the cementing material, may be washed out.

The working of these deposits is generally considered as a separate industry from the sand and gravel industry, but the United States Geological Survey does not separate the two in its reports and the writer finds it impossible to do so for the purposes of this article. There are many "regular" sand and gravel plants which sell a part of the products for the uses to which silica sands are put, such as refractories, steel molding and the like. On the other hand, consolidated deposits are worked to a small extent for concrete aggregate and plastering sands. The two branches of the industry thus overlap. In the same way the molding sand industry overlaps with both so that it, too, must be included in a general survey.

Sandstones and conglomerates are especially important in Pennsylvania, Ohio, Illinois, Indiana, Missouri, Oklahoma, Maryland and West Virginia and Texas, but these states do not contain all of such deposits that could produce commercial material. In other states are deposits which lack only a market to make them profitable.

Imports and Exports

Not much sand and gravel is imported

A consolidated deposit. Sandstone that is quarried and afterwards crushed to separate the grains to make glass sand and polishing sand

into or exported from the United States, as compared with the whole amount that is used. Exports are somewhat greater than imports. The 1923 figures show 497,762 short tons imported and 551,233 short tons exported. The import value was $259,820 and the export value $554,894. Most of the imported material came from Canada. European countries contribute a certain amount which is brought in as ballast. Some of this is glass sand. Recently, it is said that glass sand has been imported to Pacific coast ports from China.

Production and Resources of States

Figures of production for the different states in the survey which follows have been taken from the 1923 report of the United States Geological Survey as these are the latest *authoritative* figures available. As the production has increased at least 12% since that date the figures are given for their relative rather than their actual value. The tons are all short tons and the value is the price at the producing plant.

New England States

Maine: Production 531,997 tons valued at $169,905. The production is mainly from small plants, although there is one fair-sized operation near Portland. The greater part of the production was of building sand.

New Hampshire: Production 505,033 tons valued at $423,854. Production is mainly from small plants. The greater part of the production was in gravel and railway ballast.

Vermont: Production 55,551 tons valued at $18,793. Production largely composed of sand, of which 6,800 tons was polishing sand.

Massachusetts: Production 1,813,715 tons valued at $1,821,116. Production is almost equally divided (in tonnage) between building sand and gravel. Some of the larger operations of the country are situated south of Boston where there are fluvo-glacial deposits of excellent material. There is some dredging from shallow waters on the coast for both sand and gravel. One company produces glass sand in the Berkshire Hills. The resources of the state are not large and much of the sand and gravel is in small, pockety deposits.

Rhode Island: Production 69,714 tons valued at $36,373. Much the larger part of this was railway ballast.

Connecticut: Production 691,039 tons valued at $303,443. Building sand is about half the production and railroad ballast more than half of the remainder. Largest production in the vicinity of Hartford. Resources said to be ample, but scattered in small pockets.

Middle Atlantic States

New York: Production 10,730,225 tons valued at $7,291,076. These figures of production and value should be increased for present production. A preliminary estimate of the Geological Survey for 1924 puts the production at 13,397,540 tons, which brings New York first in point of tonnage. In 1923 the state was third.

The main production is in the vicinity of New York City, especially on the north shore of Long Island. The hills which border on the Sound are of sand and gravel and are so high that they often permit a working face of 150 ft. or even more. Both dry-land operations and dredging are carried on. The amount in sight is sufficient for many years even at the present rate of production.

There are a few fair-sized plants along the Hudson and several along the main lines of the railroads that cross the state. There is a well-known production of sand near Utica. Buffalo has a large production of both sand and gravel, most of the sand being dredged from the lake. Except at lake and ocean points, sand is generally short throughout the state.

However recovered, all the sand and gravel in the state is of glacial origin, although much of it has been borne by water long distances.

There is a small production of silica sand in the western part of the state. Molding sand is produced near Albany.

New Jersey: Production 6,101,204 tons valued at $4,381,855. Probably decreased in 1924 and 1925. New Jersey is famed for its production of special sands, blast sands, filter sands and the like. It is a heavy producer of gravel, but some of the deposits worked are showing signs of exhaustion. Glass sand is produced in considerable amount for use in local factories, some of which operate their own pits. The production of glass sand is increasing. The glass sand deposits are of unconsolidated material and are worked by the ordinary sand and gravel methods, such as dredging. The north half of the state is old, geologically, and in the glaciated area; the south half is new (Eogenic Marine) and the deposits are very different from those of the north half, being almost pure silica. They are in the main old beach deposits. Molding sand is produced in large quantities in the southern part of the state.

Pennsylvania: Production 9,221,292 tons valued at $9,944,019. These figures should be increased, as large plants have begun production since 1923. Pennsylvania has two areas of large tonnage production, the Pittsburgh area in which sand and gravel are dredged from the three rivers, especially from the Ohio and the Allegheny, and the Tullytown district, which is across the river from Trenton, N. J. The deposits near Tullytown are on the banks of the Delaware and are worked with dredges. In the state as a whole sand forms the larger part of the production, but there is an actual shortage of sand at Pittsburgh, where gravel is crushed to make it artificially. Most of the sand and gravel produced is glacial material which has been carried to the beds of rivers and deposited in the channels, some of it at a considerable distance from the moraines in which it was left by the glaciers. It is estimated that the Tullytown deposits may last 35 years. Sand and gravel near Pittsburgh show signs of exhaustion.

The state ranks third in the production of silica sands which are obtained from the White Medina sandstone that crosses the state and extends down into Maryland and West Virginia. The production finds a local market in the glass industry and in the steel industry for refractories and for steel casting.

Delaware: Production 53,022 tons valued at $34,113. Practically all of the production is sand. A considerable part of it is molding sand.

Maryland: Production 2,044,490 tons valued at $2,155,353. A large part of the production comes from dredging near Baltimore, but inland deposits are also worked. The greater part of the production is gravel. The state is an important producer of silica sand, the Maryland-West Virginia field lying in both states and cut through by the Potomac river. In the District of Columbia there is a considerable production of sand and gravel which is dredged from the bed of the Potomac river.

South Atlantic States

Virginia: Production 2,193,861 tons valued at $1,665,439. Production about equally divided between gravel and sand. Largest production comes from old deltas or river channels about half way between Washington and Richmond. Resources in this area are not thought to be extensive.

Virginia also produces silica sand to a considerable amount.

West Virginia: Production 2,437,600 tons valued at $3,200,648. This state is the largest producer of silica sand, which accounts for the high valuation of its production. Sand and gravel are largely obtained from dredging the Ohio river, and a considerable part of this is consumed at Charleston and other points within the state which are connected with the river by canals and tributary streams. This resource of sand and gravel is not extensive.

Silica sand is mainly produced at one point in the northern part of the state, from same White Medina sandstone that is worked in Pennsylvania and Maryland. Silica sand production in 1923 was 516,638 tons valued at $1,188,093.

North Carolina: Production 2,052,917 tons valued at $1,414,539. Greater part of the production was gravel. Largest production at points near the center of the state from what are apparently old deltas and river channels. Deposits are somewhat difficult to work on account of varying depth and difficult to wash because of an unusual amount of clay, but the quality of the washed material is unusually good. Resources are somewhat limited but enough for present production.

South Carolina: Production 581,048 tons

valued at $336,109. Largely in gravel and railroad ballast. Deposits are old stream beds and deltas, but their extent is not known to the writer.

Georgia: Production 595,117 tons valued at $300,621. As compared with other nonmetallic minerals, in which Georgia excels, the sand and gravel production of the state is small. The principal city, Atlanta, imports most of the sand and gravel it uses from Alabama. A state geological report says that most of the deposits worked are old stream beds of the Pliocene period. Resources supposed to be sufficient.

Florida: Production 513,245 tons valued at $290,082. These figures should be increased for present production. Florida imports a large amount of sand and gravel along with other concrete aggregates. Much of the state is sandy land, but good concrete sand is scarce. Some low grade pebble phosphate deposits have been worked for gravel. It is said to have unworked resources in silica sand. Other resources are not large.

North Central States

Ohio: Production 10,126,997 tons valued at $7,863,375, about equally divided between sand and gravel. Figures should be increased for present production. Ohio is the largest producer of molding sands, the 1923 production amounting to 1,053,856 tons valued at $1,688,452. There are large deposits of glacial material of excellent quality in the central, southern and western parts of the state which are worked on a large scale. Resources for future production thought to be abundant. In the northeast part of the state there is little gravel, but there are extensive deposits of sand which are worked. Sand and gravel are dredged from the Ohio river which here forms part of the southern boundary of the glaciated area. Sand and gravel are imported from Canada at Cleveland and other lake ports.

Ohio produces silica sand from rocks belonging to the Pennsylvanian system, most of which is used for furnace lining and steel casting.

Michigan: Production 9,601,562 tons valued at $5,096,071, about equally divided between sand and gravel. Principal producing area is north of Detroit, near Oxford, where there are very extensive deposits of glacial material. Aeolian deposits (dunes) on the shore of Lake Huron are worked on a large scale and the shore of Lake Michigan is dredged for plaster sand and asphalt sand. The resources of the state are said to be abundant for many years to come. There are old beach deposits in the northern portion of the state not yet worked on a large scale. The state is a large producer of molding sand.

Illinois: Production 11,951,045 tons valued at $7,460,738. Tonnage equally divided between sand and gravel. Figures should be increased for 1925. Illinois has been for years the largest producer of sand and gravel but was passed in 1924 by New York. The northern part of the state contains much glacial materials and it is crossed by terminal moraines.

Many of the deposits worked are of material that has not come far from the moraines in which it was deposited and for this reason it contains a lot of boulders and cobbles (pieces 6 in. to 8 in. in diameter). These are crushed and added to the gravel. Some of the plants have large primary crushers and batteries of secondary crushers. The deposits are deep and much of the material comes from below water level. Dragline excavators are used in the larger plants to recover this. The resources of sand and gravel are abundant for many years. The largest production is around Joliet and Aurora. There is some dredging in the Mississippi and Ohio rivers.

The state is the second in tonnage of silica sand produced, the 1923 production being 481,328 tons valued at $754,190. It also produces a large amount of special sands such as filter and blast sands. Ottawa standard sand, used in the testing of cement and concrete and mortar sands, is sent from Illinois to all parts of the country. It is a very carefully prepared silica sand. The state is a heavy producer of molding sand.

Indiana: Production 10,918,278 tons valued at $4,990,506. The larger part of the production was in gravel and railway ballast. The entire northern half of the state and part of the southern half is in the glaciated area and resources are abundant. Deposits are very extensive and also of great depth. It is not uncommon for gravel to be excavated from a depth of 100 ft. by use of the cableway dragline. The principal production is in the valley of the Wabash river near the Illinois line, and a large part of the production is shipped into Illinois. There are many smaller plants in the vicinity of Indianapolis and some dredging in the Ohio river. There is a large production of silica sand, and along the lake shore sand dunes are worked for the cheaper qualities of glass sand and molding sand.

Wisconsin: Production 5,021,608 tons valued at $2,793,999. Production about equally divided between sand and gravel. Wisconsin is wholly in the glaciated area and practically the whole state is underlaid with sand and gravel deposits, not all of which, however, are of commercial value. Resources are abundant. The state does not produce glass sand but is a large producer of molding sand and a considerable producer of special sands such as filter and blast sands.

South Central States

Kentucky: Production 2,101,840 tons valued at $1,279,441. The principal production is that which is dredged from the Ohio river near Louisville, and there is little working of inland deposits. Resources so far as known to the writer are not abundant. A small amount of silica sand and some molding sand is produced.

Tennessee: Production 1,868,337 tons valued at $1,253,084. The main supply is obtained from dredging, although some old stream channel and river terrace deposits are worked. Resources are not abundant. The Tennessee river is dredged at Chattanooga and the Cumberland at Nashville and the river beds are partially exhausted near these cities. Memphis imports gravel but has abundant sand, some of which might be used as silica sand. The Mississippi sand and gravel contains lignite and it is reported that one company has developed a successful method for removing it which it is using in large scale production.

Alabama: Production 1,829,559 tons valued at $760,236. While the production of the state is not very large, it is important because from one district near Montgomery, sand and gravel are produced by large tonnage plants of a thoroughly modern type and from this point shipments are made into five states. The deposits belong to the Tuscaloosa gravel which is found in old beach deposits in this and other parts of the state. It is said to be derived from the silicious portions of limestone deposits from which the limestone had been dissolved away long before the pebbles were brought to their present situation. Resources are abundant for present rate of production. The state produces some molding sand.

Mississippi: Production 2,772,149 tons valued at $1,229,809. Production mainly of gravel. The production is important to other states as well as Mississippi, as a considerable part of it is exported. There is some dredging from the Mississippi river, but the larger part of the production is from inland deposits. Resources said to be abundant.

Louisiana: Production 2,905,609 tons valued at $1,926,917. A large part was in paving gravel and railroad ballast. A part of production is obtained from dredging the Mississippi and other rivers. Resources are said to be abundant for the present needs, but some deposits are showing signs of exhaustion. Some attempts have been made to remove lignite from gravel in order to work deposits which would be valuable if lignite was not present.

Northwestern States

Minnesota: Production 3,826,472 tons valued at $2,184,106. Main production is gravel and railroad ballast. The largest production, near St. Paul, is from inland deposits. The state contains large areas underlaid with sand and gravel, especially in the western and southern portions, but much of the material from these is not accepted by the highway department because of the presence of shale. Some progress has been made in removing

shale. Resources are said to be not over abundant aside from the shaley material. The state is said to have silica sand resources not worked at present.

Iowa: Production 3,597,160 tons valued at $2,181,881. The larger part of the production is in sand. The supply comes from points near Des Moines and other large towns where fluvo-glacial deposits are worked and from the dredging the Mississippi and tributary rivers. Iowa is one of the states in which the shortage of gravel has been noted and attempts are being made to conserve the supply. No silica sand is produced, but there is some production of molding sand.

North Dakota: Production not reported separately. The state has one washed sand and gravel plant near Mandan which produces excellent material, used in highway concrete and concrete products. Resources are large but both sand and gravel in many places contain too much shale to make good aggregate.

South Dakota: Production 304,768 tons valued at $156,914. The largest production is in the southeast portion of the state and a considerable part is shipped into Iowa. Deposits are of glacial origin, but the material appears to have been moved long distances from the original moraines. Resources said to be abundant, but a recent report says that they are in small, pockety deposits for the most part.

Nebraska: Production 1,930,104 tons valued at $921,433. Production will show an increase for 1924 and 1925. The main production is in the eastern part of the state where one company operates 25 plants dredging the flats beside the Platt and other rivers. This production is largely of "sand-gravel," an aggregate that is prepared by very careful grading of sand and some coarser material. Resources are abundant for present production, but are by no means inexhaustible.

Southwestern States

Missouri: Production 3,719,243 tons valued at $2,007,529. This was increased in 1925. The production is mainly obtained by dredging rivers in the vicinity of the largest cities, St. Louis and Kansas City, although there is some working of inland deposits. A part of the northern half of the state is in the glaciated area. The resources are not abundant. The quantity of "make in" sand brought down in the rivers yearly by seasonal floods does not equal the production so river bars have to be worked. The resources in old river channel and terrace deposits are said to be of excellent quality in the Ozark regions. Missouri is a large producer of silica sands from the St. Peter sandstone. There is also a large production of molding sand.

Kansas: Production 1,950,411 tons valued at $1,039,064. This is mainly obtained from dredging the Arkansas, Kaw, and Neosha rivers, and by far the larger part of the production is sand. The resources are said to be not abundant.

Oklahoma: Production 1,404,185 tons valued at $974,461. This is more than half sand obtained from the Arkansas and tributaries. Resources are not over abundant. Oklahoma produces a considerable amount of silica sand.

Arkansas: Production 1,572,240 tons valued at $826,304. The greater part of this production is in road gravel and railway ballast. There is one unique operation between Little Rock and Hot Springs in which a gravel pit is worked like a quarry, by drilling with well drills and blasting. The resources of the state are said to be abundant.

Texas: Production 5,059,601 tons valued at $2,570,994. By far the larger part is pit run gravel and railway ballast. The important producing points are near Dallas and Ft. Worth and Houston. Pit run is much used as aggregate. All the deposits examined appear to be old stream beds, in many cases connected with rivers of the present time. The gravels are quite largely flints from old limestones. The resources of the state as a whole are abundant, but some of the deposits near the large centers may not outlast this generation.

Texas produces a comparatively small amount of silica sand and molding sand.

New Mexico: Production 464,410 tons valued at $239,470. The larger part of the tonnage is gravel.

Arizona: Production not reported. There is some production near Phoenix and the material is of excellent quality.

Rocky Mountain States

Montana: Production 365,303 tons valued at $156,057. This should be increased as two large plants were built in 1924. The main production is of railway ballast, much of it washed and screened.

Idaho: Production 97,044 tons valued at $43,039. Much the larger part of the production was road gravel and railway ballast.

Wyoming: Production 1,377,271 tons valued at $403,911. This was largely of railway ballast. There are some good washing plants in this state producing construction material.

Colorado: Production 185,994 tons valued at $126,967. Although the production is small, most of it is washed and screened material of good quality.

Utah: Production 1,212,077 tons valued at $290,807. Over half the tonnage was railway ballast, and the remainder largely of gravel, especially road gravel.

Nevada: Production 269,324 tons valued at $56,938. Practically all of this was railway ballast.

Pacific Coast States

Washington: Production 3,789,109 tons valued at $1,363,006. Washington has extraordinary deposits of glacial material near the larger centers of population. Some of these are of great area and 300 ft. thick, or more, and the quality of the sand and gravel they contain is very high. Not quite half the production is in railway ballast. Washed and screened material is produced in large quantities near Tacoma and other points. The state imports a small amount of gravel from Canada. Resources are abundant for the future.

Oregon: Production 1,702,439 tons valued at $1,320,483. Largest production is of washed sand and gravel for construction purposes. The main production is from dredging the Willamette and Columbia rivers and these are showing some signs of exhaustion near the larger centers. Resources as a whole are said to be abundant.

California: Production 7,205,516 tons valued at $5,033,457. The state has many plants, but they are mainly grouped near the two large centers of population, San Francisco and Los Angeles. Deposits are mainly of material eroded from the mountains of the Coast Range and Sierra Nevada which are washed into deep canyons. There is an abundance of such material. The crushed stone and sand and gravel industry may be said to overlap in California as many of the deposits contain so many boulders that crushed rock forms the larger part of the output.

The state producers a little silica sand and some molding sand.

Undistributed: Including the production from North Dakota, Arizona, and some other sources there is an undistributed production of 611,478 tons valued at $565,319.

Kansas May Revise Method of Taxing Sand

WHETHER the state of Kansas will continue to collect a 6% royalty on sand taken from navigable streams, or put the royalty on a flat tonnage basis will be decided soon. At the suggestion of W. E. Davis, state auditor, the council has asked sand men to come before it and talk over the matter.

Davis, in checking up sand royalty revenues, noticed a decided dropping off in revenues the last two years. Then he learned that some sand companies have organized themselves into two companies, an operating company and a holding company. The operating company takes sand from the river, sells it to the holding company for 20 cents a ton or less, and the other company, with the same stockholders and officers and all, then sells the sand from 40 cents a ton upward. The state gets 6% of the first sales price.

Davis has suggested that a flat tonnage royalty be placed on sand belonging to the state, and a rate fixed that will approximate 6% of the second sale prices of the "two pocket" companies.—*Topeka (Kan.) Capital.*

Sand, Gravel and Stone Producers to Make Stiff Fight on Freight Rates

Will Present Well Organized Case Before the Interstate Commerce Commission Hearing at Kansas City, January 11

THE executive secretary of the National Sand and Gravel Association has issued the following statement:

"On January 11, at Kansas City, Mo., in the Chamber of Commerce building, the National Sand and Gravel Association, speaking in behalf of the established sand and gravel industry from the Mississippi river to the Pacific Coast, will appear before the Interstate Commerce Commission in order to protest the proposal of the carriers in Western territory to increase all rates on sand, gravel and stone by 7½ cents per ton.

"Fayette B. Dow will be the attorney in charge of the presentation of the producers' case, and he will be assisted by Edwin Brooker, the latter having handled the preparation of the necessary exhibits and the securing of information for supporting the claim of the sand and gravel industry in Western territory that any additional increase in their existing rates is unjustified and unreasonable, and that they are already paying more than their just share of the transportation burden.

"Mr. Dow and Mr. Brooker, with a complete staff of assistants, have worked strenuously in preparing the case of the sand and gravel industry of the West, and the national association is confident that the Kansas City hearing will bring out facts regarding sand and gravel rates which will unquestionably prove that our materials, due to their heavy-loading and favorable transportation characteristics, are exceeded by no other commodity in their value to the railroads from a revenue standpoint.

"All Western producers are cordially invited to attend the Kansas City hearing."

The National Crushed Stone Association has retained J. S. Burchmore, a traffic counsel of Chicago, who has previously handled cases before the Interstate Commerce Commission involving mineral aggregate rates. Mr. Burchmore will be ably assisted by the traffic managers of the Columbia Quarry Co., St. Louis, and of other companies.

Highway Officials Opposed to Any Further Increases

Some weeks ago ROCK PRODUCTS addressed the following letter to the various state highway commissioners:

"There is a general belief that if the Western railways are successful in obtaining the proposed increases in freight rates, there will ultimately be similar increases in other parts of the country.

"The Western roads proposed a 7½-cent per ton increase on sand, gravel and crushed stone.

"The proposed general increase is 5%.

"We believe 7½ cents per ton is practically a 10% increase on the average sand, gravel and crushed stone freight rate.

"Practically, it is also nearly a 10% increase in the average f.o.b. plant price of these commodities.

"Our own belief is that a 7½ cent per ton increase on these particular commodities is unwise and unjustified because:

"(*a*) It will cut down the shipping radius of existing plants.

"(*b*) It will result in a smaller volume of material moved by rail.

"(*c*) It will increase the amount of material moved by trucks and the radius of truck deliveries.

"(*d*) It will increase the number of small plants and irresponsible producers.

"(*e*) It will tend ultimately to lower the quality of materials available for your use.

"(*f*) The increased traffic of these heavily loaded trucks will deteriorate your roads already paved about as fast as new pavements are laid.

"We are anxious to publish a summary of the views of the various state highway officials on this subject of proposed increased freight rates on sand, gravel and crushed stone. Will you please give us the benefit of your views?"

Opinions Expressed by Officials

ARKANSAS—"This department is opposed to the proposed increase in freight rates on sand, gravel and stone for the reason that the rates now charged by the railway companies are too high. In February, 1924, our rates on road-building materials were increased about 35% on the average, and, needless to say, this last increase has added materially to the cost of building roads. Any further increase at this time will not only reduce the mileage of road that can be built with funds available, but in many cases, prohibit the completion of important improvements because of excessive rates that must be paid on materials entering into the job. Of course, another increase in rates will force this department to locate additional supplies, and materials that are available locally; and in my opinion will reduce the amount of material being shipped by rail very materially."—H. R. Wilson, Chairman, Department of State Lands, Highways and Improvements.

ARIZONA—"Our highway commission takes very much the position that you people do."—C. M. Zander, Chairman, State Highway Department.

CALIFORNIA—"The California State Highway Commission is protesting this increase in freight rates as it will represent an increase of approximately $330 a mile on our standard 20-ft. pavement, as well as increased cost of maintenance work. We feel that the existing freight rates are too high for a comparatively low value material. Also the value of equipment used for transporting these products is not as great as the value of equipment necessary to transport many other products on which the return in freight is no larger than on sand, gravel and crushed stone. Furthermore these hauls are generally comparatively short ones, and the equipment is not out of service any great length of time. This commission entered an appearance at San Francisco, November 16, with the intention of protesting this increase, but the Interstate Commerce Commission ruled that it would accept no tesitmony on strictly intrastate movements. Inasmuch as all the rock and sand used in California is produced and moved within the state, we are waiting to appear before the State Railroad Commission in protest of such an increase."—R. M. Morton, State Highway Engineer.

GEORGIA—"In my judgment if the railroads increase the freight rates on road-building materials, such as sand, gravel and crushed stone, it will result in the construction of inferior roads, forcing the use of local materials not entirely suited to the highest class of work. It will ultimately result in the loss to the railroads of the large volume of business which they now get from the road-material interests. Freight rates on road-building materials are already almost unbearable. Increased rates will also discourage the early completion of a system of hard-surfaced roads. This system of hard-surfaced roads will do more to make our entire nation prosperous, than anything I know of. Of course, the railroads share in this general prosperity."—W. R. Neel, State Highway Engineer.

INDIANA—"In our judgment it would be a serious mistake to increase freight rates on sand, gravel and stone. We do not believe it would even be for the best interests

of the railroads."—Chas. Ziegler, Chairman, State Highway Commission.

KENTUCKY—"This department considers the freight rates on sand, gravel and crushed stone fair at the present time, and would not like to see any increase."—E. N. Todd, State Highway Engineer.

MASSACHUSETTS—"I find that an increase of 7½ cents on broken stone would average approximately 7½% on the present freight charge, which would amount to about $315 additional cost per mile of bituminous macadam road. The cost of sand and gravel would probably not be materially affected, as they are now generally secured locally. The increase on broken stone for a cement concrete road would probably be about the same in additional cost of road as named above for a bituminous macadam road."—William F. Williams, Commissioner of Public Works.

MISSISSIPPI—"We are with you in your opposition to the increase in freight rates on sand, gravel and crushed stone requested by the Western roads. We agree with you that this increase would cut down the shipping radius of existing plants, would result in a smaller volume of material moved by rail, and would increase the amount of material moved by trucks and the radius of truck deliveries; would increase the number of small plants and of irresponsible producers, would lower the quality of materials available for our use and would cause our roads to deteriorate on account of the additional truck traffic. It so happens that most of the material used in Mississippi is covered by intrastate rates, but we do import a small amount of material from other states, which would take the interstate rates, and we agree with you in your opposition to this proposed rate increase."—G. B. Denham, Office Engineer.

MICHIGAN—"While we are, of course, opposed to an increase in freight rates, or in fact, to any action that will increase the cost of road building, we wish to be fair to the railroads in case their request for increased tariff is justified."—G. C. Dillman, Deputy Highway Commissioner, Chief Engineer.

NEBRASKA—"We are strongly opposed to an increase in freight rates on sand and gravel. The proposed 7½-cent increase would increase our costs very materially, for the reason that a large part of work is gravel road construction; it being necessary to ship more than half of all the material used."—R. L. Cochran, State Engineer.

NEW MEXICO—"This department is in accord with your views and we believe the proposed increase in rates unjustified. The present rates on these commodities are exorbitant from a production cost standpoint."—James A. French, State Highway Engineer.

OHIO—"Interested as we are in highway improvements we can not help but be concerned in this matter of increase in freight rates. The evidence seems to show that the railroads at present are more prosperous than they have been for a long time, and that they are taking advantage of the road-building boom to increase rates on road-building materials. Furthermore, I do not believe that the trend of prices in other lines of business at all justifies an increase in freight rates as a general propostion."—Harry J. Kirk, State Highway Engineer.

SOUTH DAKOTA—"The freight rate increases proposed by the Western railroads on sand, gravel and crushed stone will be opposed by South Dakota through its Railroad Commission. Our opposition to these increases is based on the following facts: (1) The freight rates now in effect constitute, in the case of sand and gravel from 55 to 75% of the cost of the material f.o.b. point of delivery, and in the case of crushed stone from 30 to 50%. Combination hauls, which materially increase freight charges, are not considered in this analysis. It is our contention that the prevailing freight rates on sand, gravel and crushed stone are favorable to the railroads when compared to rates on other commodities handled. In South Dakota the construction materials referred to are handled by the railroads mostly between April 1 and September 1, which is the low tonnage season in this state for commodity transportation in general. The state has few competing lines and is subject to a high average rate. The transportation of sand, gravel and crushed stone has greatly increased by reason of the activity of highway construction, and because the material is largely handled during the season of low freight revenue, these commodities can not be said to either increase fixed cost or to materially increase operating costs. Highway construction in South Dakota will tend to increase rail haul tonnage rather than reduce it, because improved roads are already opening areas for agricultural development that were formerly considered too distant from railroad points to make agriculture profitable. This added tonnage is now, in our opinion, more than offsetting tonnage loss due to truck transportation. There is therefore an indirect benefit to the railway lines of the state which should be recognized by the railway companies, and since increased rates on these construction materials will have a hampering effect on the highway improvements and construction work requiring these materials, we feel justified in concluding that the increased rates will have a detrimental effect in that they will tend to reduce construction operations and consequently tend to reduce the quantity of materials handled by the railroads.—O. N. Hetle, Highway Engineer.

MAINE—"I am in accord with your views on the proposed increases in freight rates on sand, gravel and crushed stone.—H. E. Sargent, Chief Engineer.

WASHINGTON—"The proposed 7½-cent per ton increase in freight rates on sand, gravel and crushed stone seems out of proportion for the following reasons: (*a*) It is out of proportion to the value of the material at the plant. (*b*) The loss in transit is small. (*c*) The material is comparatively easy on railroad equipment. (*d*) The haul comes in the summer season which is the low open-top car season in this territory. (*e*) The commodity moves for the most part in large quantities. (*f*) Public works are the largest consumers. (*g*) Sand and gravel pays a fairly high rate compared with numerous other commodities. (*h*) The cars are loaded to full capacity, giving maximum returns for the movement. And for the reasons *a* to *c* inclusive, as listed in your letter."—J. W. Hoover, State Highway Engineer.

Federal-Aid Road Funds Apportioned to States

SECRETARY OF AGRICULTURE JARDINE announced the apportionment of $73,125,000 to the states for use in the construction of federal-aid roads. This apportionment was authorized by the Post Office Appropriation Act of February 12, 1925, and is for the fiscal year beginning July 1, 1926.

The new funds will be spent entirely on the federal aid highway system under the same plan of cooperation with the states that has been in successful operation for ten years. The roads included in the system are the most important in the country and reach directly or indirectly every city of over 5000 population. The bureau reports that approximately 10,000 miles of federal-aid road were brought to completion during 1925 and the indications are that the coming year will be equally successful.

The new apportionment is as follows:

State—	Apportionment Fiscal Year 1927
Alabama	$1,540,799
Arizona	1,055,908
Arkansas	1,267,907
California	2,484,706
Colorado	1,380,384
Connecticut	473,428
Delaware	365,625
Florida	897,185
Georgia	1,981,189
Idaho	936,589
Illinois	3,175,616
Indiana	1,935,890
Iowa	2,060,469
Kansas	2,072,166
Kentucky	1,416,809
Louisiana	1,000,764
Maine	683,574
Maryland	634,624
Massachusetts	1,089,055
Michigan	2,217,418
Minnesota	2,130,168
Mississippi	1,293,203
Missouri	2,406,847
Montana	1,551,660
Nebraska	1,588,138
Nevada	948,318
New Hampshire	365,625
New Jersey	934,708
New Mexico	1,187,264
New York	3,647,166
North Carolina	1,708,544
North Dakota	1,193,720
Ohio	2,777,037
Oklahoma	1,752,245
Oregon	1,182,945
Pennsylvania	3,346,920
Rhode Island	365,625
South Carolina	1,051,993
South Dakota	1,222,198
Tennessee	1,618,419
Texas	4,426,917
Utah	848,251
Vermont	365,625
Virginia	1,445,852
Washington	1,130,080
West Virginia	793,936
Wisconsin	1,870,262
Wyoming	935,594
Hawaii	365,625
Total	$73,125,000

Small Tonnage Crushing Plant With Unusual Power Unit

Stigall Construction Company, Springfield, Missouri, Uses Diesel Engine Direct-Belt Drive

THE Stigall Construction Co. operates a plant near Springfield, Mo., in which it crushes the Burlington limestone it draws from its own quarry. The plant runs 24 hr. a day for six days in the week, closing down over Sunday. The capacity is 35 tons per hour, or about 830 tons per 24 hr. With its present equpiment, the plant began operating in March, 1925.

The plant contains a No. 10 Telsmith crusher and a No. 2 Telsmith reduction crusher and sizing screens. A 10x12-in. Ingersoll-Rand air compressor and a 3-in. centrifugal pump are also installed at the plant. All these machines are driven from a two-cylinder Fairbanks-Morse full Diesel engine rated at 120 hp.

The use of a full-Diesel engine for driving a plant of this size is rather unusual. The full Diesel engine is usually thought of in connection with large power units. Its earliest applications were to such units and it is a development of comparatively recent years that has given industries full-Diesel engines in the smaller sizes. But now engineers say there is no lower limit in the size to which Diesel engines may be built, although 25 to 30 hp. represents perhaps the smallest sizes that are on the market.

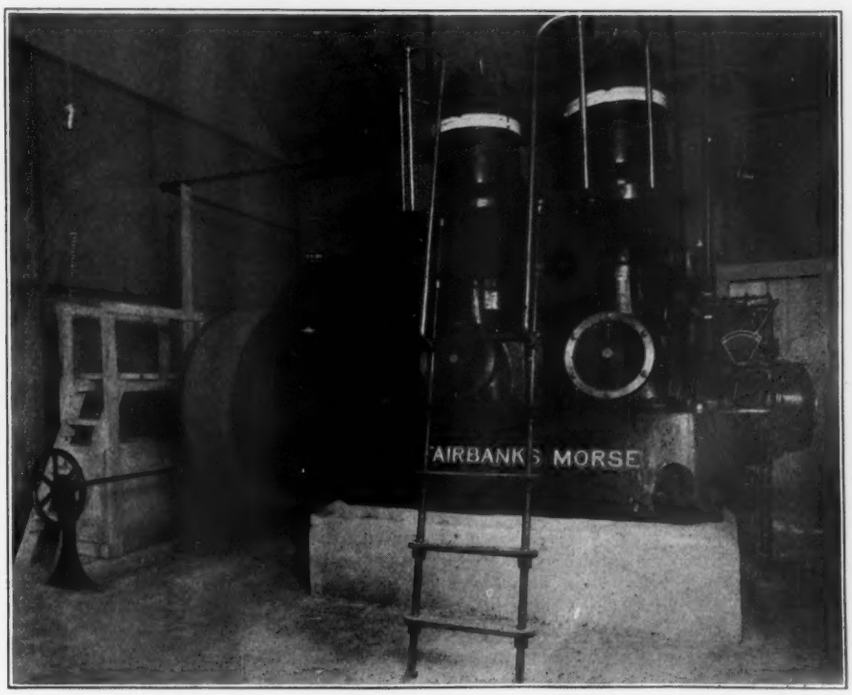
An interesting point about the drive of the crushing plant shown here is that the crushers are driven through belts and shafting instead of through electric motors and belts. The usual system today is to use the engine to generate electric power which is then transmitted to motors at the various machines. In a plant where the machines are at all scattered, this is the method to use, not only because it saves power but because it avoids a lot of trouble and complications in the plant design to permit shafting to be placed near the machines. But where a compact design permits the crushers to be placed close to the engine, the belt and shaft drive has the advantage of simplicity and a lower first cost.

Information as to this power plant has been furnished by the makers of the engine, Fairbanks, Morse & Co. of Chicago. The engine is their Type Y, Style VA, 120-hp. Diesel. It uses fuel oil which costs 7 cents per gallon at the rate of 4½ gallons per hour. In addition, the engine uses ¾ of a gallon of lubricating oil every 10 hr., and this costs 63 cents per gallon. The total cost for fuel and lubricating oil figures at 36 cents per hour.

In deciding to install Diesel power a careful comparison was made with the cost of purchased electric power to do the same work. Electric power could be had at the plant for 2 cents per kilowatt hour. This, taking into consideration all the terms of the contract by which electric power would be purchased, figured that the power cost for the plant would be $2.08 per hour. As compared with electric power there would therefore be a saving of $1.72 per hour in installing a Diesel engine. The owners of the plant figured that this saving would soon write off the investment.

The greater part of the output of the plant goes to road material, the hard limestone quarried being exceptionally well adapted for such a purpose. The plant is reported to have run steadily since it began to operate and to date there has been no repair expenes in connection with the Diesel engine.

Plant of the Stigall Construction Co., Springfield, Mo.



Full Diesel engine in the rock crushing plant of the Stigall Construction Co., Springfield, Mo. Conditions here permt direct belting to rock crushers

Financial News and Comment

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

(These are the most recent quotations available at this printing. Revisions, corrections and supplemental information will be welcomed by the editor.)

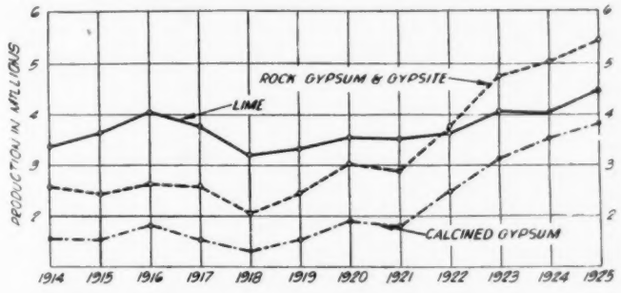
Stock	Date	Par	Price bid	Price asked	Dividend rate
Alpha Portland Cement Co. (common)**	Jan. 4	100	113	117	1¾% quar. 25% ex. Dec. 1
Alpha Portland Cement Co. (preferred)**	Jan. 4	100	109	.....	1½% quar. Sept. 1
Arundel Corporation (sand and gravel—new stock)	Jan. 6	No par	33½	34	30c quar., 60c ex, Jan. 2
Atlas Portland Cement Co. (common)	Jan. 4	No par	52	55	50c quar.
Atlas Portland Cement Co. (preferred)	.....	100	.....	.....	2% quar. Oct. 1
Atlas Portland Cement Co. (preferred)**	Jan. 4	33⅓	44	46	2% quar. Oct. 1
Bessemer Limestone and Cement Co. (common)‡	Dec. 31	100	135	140¾	1½% quar. Jan. 1, 4% ex. Jan. 1
Bessemer Limestone and Cement Co. (preferred)‡	Dec. 31	100	105	108	1¾% quar. Jan. 1
Bessemer Limestone and Cement Co. (convertible 8% notes)‡	Dec. 31	.....	115	125	8% annual
Boston Sand and Gravel Co. (common) (r)	Dec. 31	100	60	.....	2% quar. July 1
Boston Sand and Gravel Co. (preferred) (d)	Dec. 31	.....	.....	80	1¾% quar. Oct. 1
Boston Sand and Gravel Co. (1st preferred) (d)	Dec. 31	.....	.....	90	2% quar. Oct. 1
Canada Cement Co., Ltd. (common)	Jan. 5	100	101¾	102½	1½% quar. Jan. 16
Canada Cement Co., Ltd. (preferred) (f)	Dec. 31	100	116	117	1¾% quar. Nov. 16
Canada Cement Co., Ltd. (1st 6's, 1929) (f)	Dec. 31	.....	102½	103½	3% semi-annual A&O
Canada Crushed Stone Corp., Ltd. (6½s, 1944) (f)	Dec. 31	100	93½	96½	
Charles Warner Co. (lime, crushed stone, sand and gravel)	Jan. 2	No par	23	26	50c quar. Oct. 10
Charles Warner Co. (preferred)	Jan. 2	100	98	102	1¾% quar. Oct. 22
Charles Warner Co. (lime, crushed stone, sand and gravel) 7s, 1929 (r)	Dec. 31	100	106	.....	
Cleveland Stone Co.	Jan. 3	.....	145	150	1½% quar., 1% ex. Dec. 1
Connecticut Quarries Co. (1st Mortgage 7% bonds) (s)	Dec. 31	100	103	.....	
Coplay Cement Mfg. Co. (common) (4)	Dec. 16	.....	12½	.....	
Coplay Cement Mfg. Co. (preferred) (1)	Dec. 30	.....	70	.....	
Dolese and Shepard Co. (crushed stone) (a)	Jan. 7	50	73	.75	$1.50 quar. Jan. 1
Eastern Brick Corp. (7% cum. pfd.) (1)	Dec. 9	10	40c	.....	
Eastern Brick Corp. (sand lime brick) (common) (1)	Dec. 9	10	40c	.....	
Edison Portland Cement Co. (common)	Nov. 3	50	7½c(x)	.....	
Edison Portland Cement Co. (preferred)	Nov. 3	50	17½c(x)	.....	
Giant Portland Cement Co. (common)**	Jan. 4	50	42	47	
Giant Portland Cement Co. (preferred)**	Jan. 4	50	46	50	3½% s.-a. Dec. 15, plus 10% arrears
Ideal Cement Co. (common)‖	Jan. 5	No par	78	80	$1 quar. Jan. 2. 50c ex. Dec. 27
Ideal Cement Co. (preferred)‖	Dec. 31	100	106	108	1¾% quar. Jan. 2
International Cement Corporation (common)	Jan. 6	No par	66¼	66¾	$1 quar. Dec. 31
International Cement Corporation (preferred)**	Dec. 31	100	100	104	1¾% quar. Dec. 31
International Portland Cement Co., Ltd. (preferred)	Mar. 1	.....	30	45	
Kelley Island Lime and Transport Co.	Jan. 2	100	116⅛	.....	$2 quar. $2 ex. Jan. 2
Lawrence Portland Cement Co.**	Jan. 4	100	110	.....	2% quar.
Lehigh Portland Cement Co.‖	Jan. 4	50	88	91	1½% quar.
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, expire serially up to 1930) (k)	Dec. 30	100	99½	101½	
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, expire serially from 1930 to 1935) (k)	Dec. 30	100	97	99	
Michigan Limestone and Chemical Co. (common)‖	Dec. 31	.....	24	.....	
Michigan Limestone and Chemical Co. (preferred)‖	Dec. 31	.....	24	.....	1¾% quar. July 15
Missouri Portland Cement Co.	Jan. 6	25	62	63	50c quar.; 25c ex. Dec. 18
Missouri Portland Cement Co. (serial bonds)	May 29	.....	104½	104½	3¼% semi-annual
Monolith Portland Cement Co. (common) (c)	Dec. 17	.....	8	8¼	
Monolith Portland Cement Co. (units) (c)	Dec. 17	.....	23¼	24½	
Monolith Portland Cement Co. (preferred) (c)	Dec. 17	.....	7¼	7¾	
Newaygo Portland Cement Co.*	Dec. 30	.....	122	.....	
New England Lime Co. (Series A, preferred) (j)	Dec. 31	100	96½	99	
New England Lime Co. (Series B, preferred) (i)	Dec. 31	100	96½	99	
New England Lime Co. (V.T.C.) (i)	Dec. 31	.....	23	25	
New England Lime Co. (6s, 1935) (m)	Dec. 30	100	98	100	
North American Cement Corp. 6½s 1940 (with warrants)	Jan. 6	.....	99⅜	99⅜	
North American Cement Corp. (units of 1 sh. pfd. plus ½ sh. common) (z)	Dec. 31	.....	94	99	2 mo. period at rate of 7%
Olympic Portland Cement Co. (g)	Oct. 13	.....	.....	£1⅝	
Pacific Portland Cement Co., Consolidated (§)	Dec. 18	100	87	87½	
Pacific Portland Cement Co., Consolidated (secured serial gold notes)§	Dec. 17	.....	99½	100¼	3% semi-annual Oct. 15
Peerless Portland Cement Co.*	Dec. 30	10	5¾	6¾	
Petoskey Portland Cement Co.*	Dec. 30	10	9½	.....	1½% quar.
Phosphate Mining Co. (1)	Nov. 25	.....	1@5	.....	
Pittsfield Lime and Stone Co. (preferred)	.....	100	.....	.....	2% quar. Apr. 1
Rockland and Rockport Lime Corp. (1st preferred) (d)	Dec. 31	100	.....	98	3½% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (2nd preferred) (d)	Dec. 31	100	.....	70	3% semi-annual Aug. 1
Rockland and Rockport Lime Corp. (common) (d)	Dec. 31	No par	.....	70	1½% quar. Nov. 2
Sandusky Cement Co. (common)*	Jan. 2	100	110	130	$2 quar. $3 ex. Dec. 31
Santa Cruz Portland Cement Co. (bonds) (§)	Dec. 18	.....	104	106	6% annual
Santa Cruz Portland Cement Co. (common) (§)	Dec. 17	50	87½	100	$1 quar. $1 ex. Dec. 24
Simbroco Stone Co. (pfd.)	Dec. 12	.....	.....	.....	$2 Jan. 1
Superior Portland Cement, Inc. (new stock) (6)	Jan. 2	.....	45	.....	
Tidewater Portland Cement Co. (common) (3)	Nov. 25	.....	8½	.....	
United States Gypsum Co. (common)	Jan. 6	20	142	143	2% quar. Dec. 31, $2 plus 15% stock ex. Dec. 31
United States Gypsum Co. (preferred)	Jan. 6	100	115	115	1¾% quar. Dec. 31
Universal Gypsum Co. (common)†	Jan. 7	No par	21¾	23	
Universal Gypsum V. T. C.†	Jan. 7	No par	19¾	20¾	
Universal Gypsum Co. (preferred)†	Aug. 5	.....	76	.....	1¾% quar. Sept. 15
Universal Gypsum Co. (1st mortgage 7% bonds)†	Jan. 7	.....	99	(at 6½%)	
Union Rock Co. (7% serial gold bonds) (y)	Dec. 18	100	100½	102	
Vermont Milling Products Co. (slate granules) 5 sh. pfd. and 1 sh. com. (2)	Dec. 30	.....	$1 for the lot	.....	
Wabash Portland Cement Co.*	Aug. 3	50	60	100	
Winchester Brick Co. (preferred) (sand lime brick) (5)	Dec. 16	.....	10c	.....	
Wisconsin Lime and Cement Co. (1st Mort. 6s, 1940) (o)	Jan. 2	100	98½	100	
Wolverine Portland Cement Co.	Jan. 5	10	6	8	2% quar. Aug. 15

*Quotations by Watling, Lerchen & Co., Detroit, Mich. **Quotations by Bristol & Bauer, New York. †Quotations by True, Webber & Co., Chicago. ‡Quotations by Butler, Beadling & Co., Youngstown, Ohio. §Quotation by Freeman, Smith & Camp Co., San Francisco, Calif. ‖Quotations by Frederic H. Hatch & Co., New York. (a) Quotations by F. M. Zeiler & Co., Chicago, Ill. (b) Quotations by De Fremery & Co., San Francisco, Calif. (c) Quotations by A. E. White Co., San Francisco, Calif. (d) Quotations by Lee, Higginson & Co., Boston, Mass. (f) Nesbitt, Thomson & Co., Montreal, Canada. (g) Neidecker and Co., Ltd., London, England. (i) E. B. Merritt & Co., Inc., Bridgeport, Conn. (k) Peters Trust Co., Omaha, Neb. (m) Second Ward Securities Co., Milwaukee, Wis. (o) Central Trust Co. of Illinois, Chicago, Ill. (r) J. S. Wilson Jr. Co., Baltimore, Md. (s) Chas. W. Scranton & Co., New Haven, Conn. (x) Price obtained at auction by Barnes and Lofland, Philadelphia, on Nov. 3, 1925. (y) Dean, Witter & Co., Los Angeles, Calif. (z) Hemphill, Noyes & Co., New York. (1) Price obtained at auction by Adrian H. Muller & Sons, New York. (2) Price obtained at auction by R. L. Day & Co., Boston. (3) Price obtained at auction by Weilepp-Bruton & Co., Baltimore, Md. (4) Price obtained at auction by Barnes and Lofland, Philadelphia, Pa. (5) Price obtained at auction for lot of 50 shares by R. L. Day & Co., Boston, Mass. (6) Quotations by Bond & Goodwin & Tucker, Inc., San Francisco.

Editorial Comment

Lime-Gypsum Production

The lower half of the graph on page 85, December 26 issue, on our editorial review of the rock products industries in 1925 was mis-labelled, as doubtless many lime and gypsum producers have discovered. The broken dash line representing the production of gypsum is based on the U. S. Geological Survey reported production, and our estimate of 1925 production, of *raw rock gypsum and gypsite,* not calcined gypsum, as


PRODUCTION IN MILLIONS
ROCK GYPSUM & GYPSITE
LIME
CALCINED GYPSUM
1914 1915 1916 1917 1918 1919 1920 1921 1922 1923 1924 1925

Producton of lime, calcined gypsum and raw rock gypsum and gypsite in millions of tons

it was erroneously labelled. There is of course no real comparison between raw gypsum and lime. The graph is reproduced herewith with the correct production of calcined gypsum added. At no time has the annual production of calcined gypsum exceeded the annual production of lime, and there is little possibility, apparently, that it will do so, since the graphs have remained approximately parallel during a period of very active competition.

The probabilities are that gypsum manufacturers will lose eventually interest in the wall-plaster end of their industry, as such products as gypsum sheathing (wall board) are further developed. The prospect ahead of the gypsum industry of replacing inflammable wood sheathing in ordinary frame house construction with fireproof gypsum wall board sheathing, at approximately the same, or only slightly greater cost, is an outlook such as few industries have ever enjoyed. Obviously with fields like that to develop, and there are others almost equally enticing, gypsum producers will not have to worry about the loss of a wall-plaster contract now and then to lime.

On the other hand, if lime manufacturers will concentrate their energies on developing the wall-plaster end of their business, instead of chasing phantoms in the way of building tile, and what not, there is undoubtedly a great future ahead in the development and growth of the lime-plaster industry. Of course, much progress has been made recently by lime manufacturers along this very line; and experiments are promising.

The Convention Month

January is the month of conventions, not only in the rock products industries but in practically all industries which are seasonal in their nature. At this writing it is said that there are no reservations to be had for January dates in the "loop district" hotels of Chicago, since all have been taken by those who will attend the "road show" and other conventions which come in that month.

The convention is firmly fixed in American business life. Not so many years ago it was looked on by many members of trade associations as a good excuse for a winter vacation and a fine chance for men in the same business to get together and "talk shop," which is something that everyone really interested in his business enjoys. Papers were read and discussion followed but principally because it seemed the proper thing to have papers and discussions at conventions.

Today this has been changed and everyone who has followed conventions for the last few years knows that they have gained in seriousness and purposefulness even more than they have gained in attendance. Real problems, both technical and economic, are not only discussed but often solved. Decisions are made that have their effect upon legislation and the actions of state and federal commissions. Contact with the public is gained through the reports that are published day by day in the newspapers. Trade practices are revised, established and discontinued.

The day of the individualist in business, the "lone wolf" who looked upon everyone in the same line as himself as an enemy, is passing. The most independent producer must recognize that such matters as just freight rates, trade practices and the specifications which control the sale of his product affect his business as they do any other man's. No matter how much he is inclined to disregard the ideas of others, self interest will compel him to act with others in considering such things. He goes to a convention and experience shows that he undergoes a change of heart.

Two of the largest associations in the rock products industries hold conventions this month, the National Crushed Stone Association and the National Sand and Gravel Association. It goes without saying that every member of these associations who can be present will attend. What is wanted even more than this is that those producers who are not members shall attend. They will see then how much it is to their advantage to belong to the only organization that can speak for the industry as a whole, and once they have seen this they may be counted upon to join the association and give it their full support.

Superior Portland Bond Offering

BOND & GOODWIN & TUCKER, Inc., Seattle, Wash., are offering 100,000 shares of Superior Portland Cement, Inc., Seattle, Wash., new issue of Class "A" participating stock (with no nominal or par value) at a price of $45 per share, yielding about 7.33%. Convertible at any time until any date specified for redemption into class "B" common shares at the rate of one share of class "B" stock for each share of class 'A" stock. Dexter Horton National Bank, Seattle, Wash., registrar and transfer agent.

John C. Eden, president of the Superior Portland Cement Co., who will hold the same office in Superior Portland Cement, Inc., has summarized the details in the following letter:

History—Superior Portland Cement, Inc., is being formed under the laws of the State of Washington to acquire all of the properties, business and assets of the Superior Portland Cement Co., thereby succeeding in interest to a business established in 1907. At the inception of this business an initial capital of $600,000 was paid into its treasury and under a continuous management the company has grown to its present size through the reinvestment of earnings without the addition of outside capital.

In December, 1919, the company acquired the assets and business of the Washington Portland Cement Co. through outright purchase, for approximately $1,200,000. This total cost had all been written off the books of the Superior Portland Cement Co. by the middle of 1924. An issue of $1,000,000 of its 6% bonds, created in 1919 and due serially 1923-1935 in part payment of the purchase of the Washington plant had been paid off in full out of earnings by November 5, 1924. The plant of the Washington company been absorbed into the present plant of the Superior company.

Plant—The plant of Superior Portland Cement Co. is located at Concrete, Wash., where it operates six kilns and has a daily capacity of 5,000 bbl. of clinker or raw cement. In addition, it is equipped with ample clinker storage and can grind 7,000 bbl, per day of finished cement. This enables the company to increase its output economically when demand is at the peak.

The company also owns a hydro-electric power plant supplying economically about 63% of the power requirements of its cement mills. It also owns an undeveloped power site capable of producing enough additional power to furnish the company's total needs. A recent contract made with the Puget Sound Light & Power Co. supplies the additional requirements of the company at rates so favorable as to preclude the necessity of further developing its own properties.

The plant is favorably located in respect to fuel supply and to its extensive deposits of limestone and clay as well as to transportation facilities, being situated on a spur of the Great Northern railroad. The limestone deposits are estimated to contain materials adequate for the operation of this plant at present capacity for over 75 years.

Situated on a 40 acre site this plant employs the wet process of manufacturing portland cement. It is served by an aerial tramway, 6,600 ft. long which conveys the limestone from the quarry to the mill. This tramway, completed in June, 1925, is highly efficient in its operation and has a capacity of three times the present requirements of the mill.

Markets—Superior Portland Cement Co. is the largest of four cement companies operating in the State of Washington whose territories are quite clearly defined by the limitations of freight rates. This company serves Western Washington and Alaska. Included in its territory are the cities of Seattle, Tacoma, Vancouver, Everett, Bellingham, Aberdeen, Grays Harbor, Olympia, Hoquiam, South Bend, Raymond, Mt. Vernon, Blaine, Chehalis, Centralia, Yakima and Wenatchee. Dealers representing the company are resident in most of these cities. This company's position in the industry is indicated by the fact that it ships approximately 56% of the cement tonnage in the State of Washington. The company's record of collections against sales shows that approximately 99½% of its accounts receivable has been collected in cash within ten days of delivery. Its losses through bad debts have been practically negligible.

CAPITALIZATION
SUPERIOR PORTLAND CEMENT, INC.
(Upon completion of present financing)

	To be presently authorized Shares	To be presently outstanding Shares
Class "A" Participating Shares (No par value)	100,000	100,000
Class "B" Common Shares (No par value)	100,000	100,000

No funded debt.

Stock Provisions—The articles of incorporation of Superior Portland Cement, Inc., provide that class "A" participating stock is preferred as to assets and as to dividends up to 27½c per share per month accruing from Dec. 1, 1925. After preferred dividends have been paid on class "A" stock, dividends not exceeding $1.50 per year may be paid on class "B" stock. Class "A" shares participate equally per share with class "B" stock in all dividends in excess of $1.50 per year on such class "B" stock.

The charter of the corporation provides that no mortgage, lien or other incumbrances on the properties of this corporation may be created, or any bonds or notes (excepting purchase money obligations) having a maturity longer than one year, may be issued except with the consent in writing of a majority of the class "A" stock then outstanding. It is further provided that no stock having priority over the class "A" participating shares may be issued by the corporation except upon consent of the holders of a majority of class "A" stock.

Class "A" stock shall have the right to vote at all stockholders' meetings only in the event that twelve monthly dividends shall have accumulated and be unpaid, and such right to vote shall continue until all accumulated and unpaid dividends shall have been paid.

It is further provided that the class "A" stock may be converted, at the option of the holder, at any time until any date specified for redemption into class "B" common shares on the basis of one share of class "B" stock for each share of class "A" stock.

Assets—The attached balance sheet of Superior Portland Cement Co. as of Oct. 31, 1925, as certified by the auditors, Messrs. Peat, Marwick, Mitchell & Co., gives effect to the appraisal of the commercial value of plant and properties of the company made by Messrs. Ford, Bacon & Davis, Inc., and shows a ratio of current assets to current liabilities of about three to one. Total net assets are $6,975,080.63, or $69.75 per share of class "A" participating stock.

Earnings—For the three years ended Dec. 31, 1925, (with two months of 1925 estimated) the productive capacity, net sales, and net income available for depreciation, depletion, interest, income taxes and dividends are as follows:

	Productive Capacity in Barrels	Net sales	Net earnings Available for Depreciation, Depletion, Interest, Income Taxes and Dividends
1923	1,387,000	2,557,604	996,212
1924	1,387,000	2,293,296	909,986
1925	1,825,000	3,144,366	1,082,611

The annual average of such net income for three years, is at the rate of $9.96 per share of class "A" participating stock, while after depreciation, depletion, interest charges and income taxes is at the rate of $7.46 per share of class "A" stock against annual dividend requirements of $3.30.

It is interesting to note that without exception the predecessor company has not failed to show a profit in any of the seventeen years of its corporate existence. Dividends have been paid monthly without interruption for over 10 years.

The Cement Industry—It is worthy of note that in our territory public opinion is fully committed to the use of concrete. Highway development is the largest consumer of cement in this state. The State of Washington's Highway Specifications are 100% for concrete roads. The same is true of the specifications of the City of Seattle, while among the counties there are only two whose specifications do not call for concrete exclusively.

Management—The management of the corporation will remain with John C. Eden, for seventeen years president and active head of Superior Portland Cement Co., who will become president of the new company. The board of directors will include John C. Eden, Nion R. Tucker, J. H. Kane, Geo. E. Dickinson, J. J. Murphy, J. A. Swalwell, C. L. Wagner, and R. V. Ankeny, who will be active in the affairs of the company.

Listing. It is expected that class "A" participating shares will be listed on the San Francisco Stock and Bond Exchange and on the Los Angeles Stock Exchange.

Lincoln Sand and Gravel Bonds Offered

MATHNEY, DIXON AND CO., Springfield, Ill., are offering at prices to yield from 5½% to 6½%, according to maturity, $100,000 first mortgage 6½% gold bonds of the Lincoln Sand and Gravel Co., of Lincoln, Ill.

Dated December 1, 1925; due serially 1926 to 1931. Principal and interest (J. and D.) payable at office of Mathney, Dixon and Co., Springfield, Ill. Denominations $1000 and $500. Redeemed in reverse numerical order, on 30 days' notice, at 102 and interest prior to November 2, 1927, and at 101 and interest thereafter. First Trust and Savings Bank, Springfield, Ill., trustee.

Capitalization	*Authorized*	*Issued*
First mortgage 6½% bonds (this issue)	$100,000	$100,000
Common stock (par $100)	250,000	250,000
8% cum. pref. stock (par $100)	50,000	None

Company.—Established in 1905 (incorported in Illinois, 1917) at a time when the production of washed, screened and graded sand and gravel was in its infancy, and has been brought to the position of one of the largest industries of its kind in Illinois. Properties consist of 350 acres of land adjoining the city of Lincoln, Ill., where they have installed every modern and economical provision for the production of sand and gravel, including 3¼ miles of standard gage railroad, connecting their property with the Illinois Central, the Chicago and Alton and the Illinois Traction System, together with three locomotives. Company also owns 37 acres of land near Petersburg and 12½ acres near Barry, Ill., with necessary equipment for operation. The untouched deposits of sand and gravel at Lincoln only have been conservatively estimated at 8,890,000 tons, which would require more than 40 years to exhaust with an annual production of 250,000 tons.

Sales and Earnings.—Annual production and sales for the past six years has averaged 256,874 tons. Net earnings (after allowance for taxes, interest, deprecaition, depletion and obsolescence) for the same period average $31,201, equal to over six and one-quarter times the annual interest requirements, and equal to more than two times the average requirements for both principal and interest.

Sinking Fund.—A sinking fund will be provided, beginning January 25, 1926, payable monthly thereafter to the trustee, into which shall be paid 6½ cents per ton upon all sand and gravel produced, to be used to pay principal and interest when due, any excess to be used to redeem bonds.

Purpose.—To refund existing bonds and mortgages, pay bank loans and provide additional working capital.

National Cement Company of United States NOT in Need of Funds

THE editors very much regret a financial news note on page 67, Rock Products, November 28 issue, to the effect that the National Cement Co. of Birmingham, Ala., intended to sell its assets to a newly organized company. The item was intended to refer to the new National Cement Co., Montreal, Que., and was erroneously ascribed to the National Cement Co. of Birmingham, Ala., of which George E. Nicholson, of Kansas City, Mo., is president. The National Cement Co., of Birmingham, Ala., with plant at Ragland, Ala., makes one of the oldest and best known brands, the "Coosa," in the South.

International Cement Corporation Quarterly Earnings

FOR the quarter ended September 30, 1925, the net income of the International Cement Corp., New York City, was $1,352,898 after charges, depreciation and federal taxes, equal after preferred dividends to $2.35 a share on 500,000 no-par common shares, against $1,110,603 net, or $2.62 a share earned on 400,000 shares in the last preceding quarter and $921,426 net, or $2.36 a share earned on 364,167 shares in the third quarter of 1924. Net income for the first nine months of 1925 was $3,177,439, equal to $5.79 a common share, against $2,041,729 net, or $5.24 a share earned in the first nine months of 1924.

INTERNATIONAL CEMENT CORP.—QUARTERLY EARNINGS

Period—	Quarter Ended Sept. 30, '25	Quarter Ended Sept. 30, '24	Nine Months Ended Sept. 30, '25	Nine Months Ended Sept. 30, '24
Gross sales	$7,163,528	$4,955,033	$16,398,031	$12,403,945
Less pkg., dis., and allowance	1,349,332	912,884	2,990,571	2,256,679
Mfg. costs, excl. depreciation	2,891,585	1,989,291	6,527,737	5,071,368
Depreciation	328,131	298,976	769,892	746,535
Manufacturing profit	$2,594,480	$1,753,882	$ 6,109,831	$ 4,329,363
Ship., sell., and admin. exp.	946,158	626,175	2,257,543	1,733,031
Net profit	$1,648,322	$1,127,707	$ 3,852,288	$ 2,596,332
Miscellaneous income	6,456	33,237	19,620	57,273
Gross income	$1,654,778	$1,160,944	$ 3,871,907	$ 2,653,605
Federal tax. and conting. res.	301,880	239,518	694,468	611,875
Net to surplus	$1,352,898	$ 921,426	$ 3,177,440	$ 2,041,729

U. S. Gypsum Not To Buy Beaver Board

ANOTHER denial of a widespread rumor was had when Sewell Avery, president of the United States Gypsum Co., stated that his company has no intention of acquiring the Beaver Board companies. He says: "There never has been any discussion of such a move and there is not the remotest possibility of our purchasing Beaver Board."—*Chicago Journal of Commerce.*

Note: In a previous article in the *Chicago Journal of Commerce* the possible acquisition of the Beaver Board companies by the U. S. Gypsum Co. was rumored. This article, credited to its source appeared in Rock Products, November 28 issue. Since that time the above statement by Sewell Avery, president of the U. S. Gypsum Co., has definitely spiked these rumors as untrue. —*The Editors.*

Sonoma Magnesite Brings Low Price

THE brokerage firm of Adrian H. Muller and Sons, New York, recently sold at public auction a lot of securities among which were 10 shares of Sonoma Magnesite Co. common stock of $10 par. The entire lot, which includes a large number of oil and copper stocks, went for $20.

Canada Asbestos Firms Announce Merger Terms

THE Asbestos Corporation of Canada has made public the terms of the proposed merger of seven companies. Vote on the merger was taken recently at a general meeting.

The companies are: Asbestos Corporation of Canada, Consolidated Asbestos, Federal Asbestos, Thetford Vimy, Maple Leaf Asbestos Corp., Asbestos Mines and the Black Lake Asbestos and Chrome Co.

Preferred shareholders in the Asbestos Corp. are to receive for each share a $100 bond and one-fifth of a share of new cumulative 7% preferred stock and one and one-tenth shares of no par common stock. Bondholders may exchange their present holdings for 6% bonds, and holders of common stock will receive one and one-tenth shares of the non-cumulative 7% stock and one and one-tenth of the no par value common stock of the reorganized company.—*Chicago (Ill.) Tribune.*

International Employees Oversubscribe Stock

THE stockholders of the International Cement Corp. of N. Y., at their annual meeting on June 19, 1925, authorized the distribution of 20,000 shares of common stock among officers and salaried employees of the corporation and its subsidiaries.

Each employee was permitted to subscribe to stock in an amount equivalent to his or her yearly salary. The price charged for the stock was $50 per share, although at the time of the allotment it was quoted on the New York Stock Exchange at approximately $75 per share. No one is permitted to purchase the stock outright, under the terms of the arrangement, but payment is to be made quarterly at the rate of $2 per share. If an employee leaves the company before his stock is fully paid for, or if payments are defaulted, the money paid up to that time will be returned with interest. The equivalent of dividends will be credited and 5% interest will be charged on unpaid balances.

Practically every one to whom the opportunity was offered subscribed. The result was a large over-subscription, and the available shares had to be allotted on a prorata basis.

All Set for Crushed-Stone Convention

Business and Pleasure Both Anticipated

PRESIDENT GRAVES, of the National Crushed Stone Association, writes the editors under date of January 4:

"For an extended period of time the National Highway Research Board conducted an investigation of reinforced-concrete pavements under the direction of C. A. Hogentogler. His report on this investigation was presented and discussed at the annual meeting of the Board in Washington, December 3 and 4.

"We are particularly gratified in that Mr. Hogentogler has accepted our invitation to address the Montreal convention on the subject of this investigation. His talk will concern itself primarily with a recital of the conditions found on various concrete roads. We regard his work as the most important contribution to highway investigation conducted during the past year and we are sure that everyone at Montreal will be greatly interested in learning of the conditions found by the man who conducted this survey."

This is only one of many interesting and instructive subjects on the Montreal convention program, which was published in detail in the December 26 issue of ROCK PRODUCTS.

The mayor of Montreal has sent out a general letter, of one of which we have been a recipient. Of Montreal as a city, he writes (and he ought to know): "Montreal, while possessing all the advantages of a modern city, has in addition characteristics of its own which make it distinctive among the great cities of the world. Its numberless attractions, its historic associations and scenic grandeur together with its dual population of English and French speaking citizens, with a seasoning of almost every other race from the two hemispheres, render enjoyable a stay limited only by the time at the disposal of the visitors."

Railway Arrangements

Every one attending the convention should procure a special convention certificate which will entitle him to half-fare on the return trip. Special cars will be operated over the Canadian Nationals Rys. and connecting lines as follows:

LEAVE CHICAGO—5:30 P. M. Grand Trunk—Canadian National Rys., Dearborn St. Station, on Saturday, January 16.

LEAVE DETROIT—11:15 P. M. Grand Trunk—Canadian National Rys., on Saturday, January 16.

LEAVE BUFFALO—6:30 P. M. Grand Trunk—Canadian National Rys., on Sunday, January 17.

LEAVE WASHINGTON, D. C.—2:30 P. M. Pennsylvania-Canadian National Rys., on Sunday, January 17.

LEAVE BALTIMORE—3:25 P. M. Pennsylvania-Canadian National Rys., on Sunday, January 17.

LEAVE WEST PHILADELPHIA—5:36 P. M. Pennsylvania-Canadian National Rys., on Sunday, January 17.

LEAVE TRENTON, N. J.—6:22 P. M. Pennsylvania-Canadian National Rys., on Sunday, January 17.

LEAVE NEW YORK CITY—8:00 P. M. Pennsylvania-Canadian National Rys., on Sunday, January 17.

LEAVE NEW HAVEN, CONN.—10:04 P. M. New York, New Haven & Hartford R. R., on Sunday, January 17.

LEAVE ..HARTFORD, ..CONN.—10:57 P. M. New York, New Haven & Hartford R. R., on Sunday, January 17.

The train from Chicago is a section of the International Limited and arrives in Montreal on Sunday, January 17, at 5:00 P. M. The train from Washington, Philadelphia and New York is the Montrealer and arrives in Montreal on Monday morning, January 18, at 8.05. The special car from Detroit will be joined to the Chicago section at Toronto on Sunday morning.

The Canadian National Rys. are doing everything possible to make the trip as enjoyable as the convention itself.

Quarry men from other sections of the country may get accommodations on any of these special cars, as enough cars will be added to take care of all comers.

Toboggan slide at Montreal. To be visited by crushed stone producers this month

Atlanta Convention of Importance to Every Producer

Matters To Be Discussed Which Will Be of the Greatest Interest to Every Sand and Gravel Producer

THE coming convention of the National Sand and Gravel Association in Atlanta, January 19 to 21, promises to be by far the best attended and the most important convention in the history of the association. There are several reasons why this should be so. One of them is that localities like the Pacific Coast which have hitherto been represented by occasional individuals will this year be represented by groups. Another is that intense interest attaches to this convention on account of the recent inauguration of research and engineering work. But probably the most powerful reason is that producers in almost every section of the United States have had a good year.

The industry as a whole is in a remarkably healthy condition. It is growing as an industry ought to grow; that is, within itself. The increased production of 1925 over 1924 came almost wholly from companies already in the business. Practically all the new plants erected were put up by companies engaged in sand and gravel production, either to take the place of old plants, or to provide for larger outputs at lower costs. The day of the fly-by-night producer and the promoter who promises 100% dividends from a $10,000 investment in the sand and gravel business is going fast.

Atlanta is a delightful city in which the people have learned to combine the charm of Southern life with the energy demanded by our modern industrial existence. The hotels of the city are excellent. A good many of those who attend the convention will want to stay over for a day or two to see the city and its environments.

According to the *National Sand and Gravel Bulletin*, arrangements have been made with Mrs. Norman Sharp, president of the Atlanta Woman's club, to provide especial entertainment for the ladies, whose attendance always adds so much to the conventions of this association. On Wednesday morning, January 20, there will be a sightseeing trip to Stone mountain, of which everyone knows, and on Thursday the ladies will be the guests of the Woman's club at luncheon. Of course there will be the usual informal annual dinner with music and entertainment which will be held on the evening of the 20th.

The program, which was published in the December 26 issue of ROCK PRODUCTS shows that this convention is one that no sand and gravel producer, whether he be a member or not, can afford to miss. All of it will be of interest. But there are two matters to be discussed which are so important that it might be said that they are of vital interest to the industry.

One of these is the report of the washed-gravel ballast committee. The business of producing washed and screened gravel for railroad ballast has made great progress in the past year, due largely to the efforts of this committee. But in many parts of the country the ballast business is still more or less in the development stage and to these the action of the committee and the convention is especially important.

The other matter will be introduced by Stanton Walker, the newly appointed head of the engineering and research department of the association. He will speak on the subject, "Should the National Sand and Gravel Association Promote Standardized Specifications for Sizes of Sand and Gravel." This, of course, is something that affects every producer, and the action taken by the convention in this matter will have a far reaching effect.

It is expected that the concrete products division meeting will be largely attended, as the interest in these products is constantly increasing.

The railroads offer reduced rates to Atlanta on the certificate plan and every producer who attends should get a certificate when he purchases his ticket. It has too often happened at conventions of this kind that the failure of only two or three to ask for certificates has resulted in everyone having to pay full fare for the return trip, when the attendance was far more than enough to justify the granting of the reduced return rate by the railroads.

Much Cold-Weather Demand for Aggregates in Chicago

RETAILERS are drawing heavily on their storage piles of sand, gravel, and crushed stone in Chicago, according to the *Journal of Commerce*. In all parts of the city concrete work was being rushed. Indications now are that, barring heavy snow and extreme cold, December will establish a new record in this market for the mixing of concrete.

Demand is running ahead of December a year ago, and as yet dealers have experienced but little difficulty resulting from the handling of frozen aggregates.

Complaint still was heard concerning low prices. This was due more or less to keen competition. The season of torpedo sand and gravel production is about over and the pits are closing for the winter months.

It was reported that the dealers anticipating a season of more active winter building are well stocked on aggregates. In many instances, however, the tendency is to go along with stocks of cement, plaster, lime, brick and the other materials easier to replenish, kept as low as possible until after inventory. This portends an active early 1926 demand for all those items. A continuation of open weather will result in the completion of a large volume of foundation and other work and these jobs will be ready for deliveries on inside materials in time to take up any possible slackening in the demand for the aggregates.

The yards in the far south side districts were unusually busy on deliveries of rough materials. The most of them still had about their full equipment busy, and a large part of the tonnage moving was going to large concrete jobs, such as apartments, industrial plants, schools, and other substantial improvements.

Hawarden Gravel Company To Improve Pit

THE Hawarden Gravel Co. of Hawarden, Iowa, has undertaken extensive improvements which will entail an outlay of approximately $20,000. Work has been started on new sand bins and the old bins will be wrecked. When the work is completed, the gravel pit will have a capacity for loading out 30 carloads of gravel a day. The dredge at the pit was entirely rebuilt a short time ago and the entire plant electrified. J. O. Burlington is manager of the company.—*Sioux City (Iowa) Journal.*

Rhodes-Jamieson Company to Enlarge Pleasanton, California Plant

THE Rhodes-Jamieson Co., San Francisco, Calif., have announced their intention of enlarging their present plant at Pleasonton, Calif. Their plans include the erection of a number of buildings and the installation of machinery new in the gravel industry.

At the present time the company employs 300 men and they expect to put 100 more to work before the first of March, when the new work will be completed. The company is one of the largest sand and gravel producers on the West Coast, operating over seven plants in that district.—*Pleasanton (Calif.) Times.*

Indians Want to Sell Sand and Gravel

IS the state of Oklahoma in the sand and gravel business illegally? Who owns the river beds? These questions will be raised at a meeting of the Five Civilized Tribes to be held soon at Muskogee, Okla.

Thousands and thousands of dollars have been paid to the state in the form of a tax on sand and gravel taken from river beds.

No one really claims title to the river beds. The tribes contend they have not been allotted and belong to them and, if any tax is levied, it should be paid to the tribes and not to the state.

When asked about the report, W. H. Harrison, chief of the Choctaws, admitted that was the subject of the conference with the Creeks who visited him recently.

"The Choctaws would like to go into the sand and gravel business if that is the case," the chief said. "The Creeks are in litigation with the state and federal governments regarding mineral rights, but the sand and gravel are the only features that the Choctaws would be interested in as far as their litigation is concerned."—*Oklahoma City (Okla.) Times.*

Orman Crushed Rock Company to Build New Gravel Plant

PREPARATION have been made by the Orman Crushed Rock Co., Pueblo, Colo., for the erection of a new sand and gravel plant on the west bank of the Fountain river, Pueblo, Colo. The plant is to be a modern, completely equipped and able to handle a maximum capacity of 500 cubic yards of sand and gravel a day.

Bins will be installed by the company to supply trucks for local business. Trackage on the Rio Grande, Santa Fe, Colorado & Southern and Missouri Pacific railroad lines has been obtained, to make available shipment on all lines for points without the city.

Plans have also been completed for the erection of an office building near the new plant. Work is being started on this now. Both the Orman Crushed Rock Co. and the Orman Construction Co. will have offices in this building.—*Pueblo (Colo.) Crieftain.*

Steam Shovel Turns Over at Quarry

AN unusual accident was recently reported in the phosphate rock quarry plant of the United Phosphate and Chemical Co., at Midway, Ky., in which Henry E. Cox, 35, engineer on the dinky line, and steam shovel operator, was instantly killed, when an overloaded steam shovel turned over, and pinned him. He had been loading the rock onto cars of the dinky train, when he picked up a piece of rock that was beyond the handling capacity of the shovel, in the position it was in at that time.

France Stone Company to Rebuild Monroe Plant

THE Monroe, Mich., plant of the France Stone Co., recently destroyed by fire, will soon be rebuilt, according to a statement made by N. R. France, president of the company. The new equipment to be installed will consist in part of one mill, four crushers, 10 revolving screens and the daily output about 2000 tons of crushed stone. Mr. France declared the improvement would cost about $300,000 and the plant would be in operation by next June, providing there would be no delay in the arrival of the steel. About 100 people will be employed.—*Toledo (Ohio) Blade.*

Kansas City Abandons Municipal Quarry Plan

PLANS for opening a municipal rock quarry to be operated mainly by prison labor in Kansas City, Kan., have been abandoned to an indefinite time.

Henry F. Schaible, commissioner of streets, announced that it would be impossible to start the project this year, due to a lack of funds in the mayor's department.

Mr. Schaible asserted that he had a surplus of $5,000 in the street department which could be diverted to this project, but that he deemed this amount insufficient to open and maintain a quarry.

It was planned to reopen a local quarry and use the quarried rock in the construction of a new workhouse for the city—*Kansas City (Mo.) Times.*

Los Angeles Company Purchases Tufa Quarry

THE Bly Stone Co. of Los Angeles, Calif., recently signed a contract for the purchase of the C. D. Rynerson tufa quarries near Kirkland. The transaction which will involve the transfer of a large section of land and will mean the active operation of the quarries and the use of the native rock of Yavapai county in the construction of important buildings and homes in Los Angeles, it is expected. The contract with the Bly company will call for the shipment of at least 10,000 yd. of the tufa each month, it is said.—*Flagstaff (Ariz.) Sun.*

Paul Klyne Made District Manager of Greenville Gravel Company

PAUL KLYNE, for the past three years plant manager of the Urbana-Greenville Gravel Co., Urbana, Ohio (subsidiary of the Greenville Gravel Co.) has been named district manager for the Columbus, Mechanicsburg and Urbana plants of the Greenville Gravel Co. He will be succeeded at the Urbana plant by Edward Mills, manager of the Mechanicsburg plant. Mr. Klyne came from Mechanicsburg, where he was in charge of that plant for 7 years and before that was in similar business at Piqua for an equal period.—*Urbana (Ohio) Democrat.*

Vermont Slate Finds Favor on West Coast and in Florida

THE slate industry throughout Vermont has just finished what might be termed as a successful year. Despite the fact that a strike early in the year held up shipments, the demand was good and continued so. One producer looks for a larger volume of business in 1926 which will probably diminish as the year goes along. A large percentage of this producer's product, sea green slate, was shipped to Florida and California.

Stroke Fatal to H. W. Blocksom

HORACE W. BLOCKSOM, sales manager for the Wasem Plaster Co., and one of the best known plaster men in the middle west, died at Mercy hospital, Christmas morning at 2 o'clock. Taken ill suddenly Christmas eve with a stroke of apoplexy while entertaining friends in his apartment in the Wahkonsa hotel, Mr. Blocksom never regained consciousness.

News of Mr. Blocksom's death, which spread rapidly around Fort Dodge on Christmas, cast a gloom over many circles. During his thirteen years' residence in Fort Dodge he made loyal friends who were devoted to him. It was known that Mr. Blocksom was not in sound health. For the past year he had been failing, but no such sudden developments had ever been anticipated.

Born in Zanesville, Ohio, November 28, 1868, he just passed his fifty-seventh birthday. For twenty-five years he has been selling gypsum products, taking his position with the Wasem Plaster Co. in 1912. He is survived by one son, Horace W. Blocksom, and a grandson, who live in Boston, Mass.; a brother, George W. Blocksom, and a sister, Mrs. Mae Widney.

Funeral services were held Sunday, December 27, at Fort Dodge, Iowa. Dr. W. O. Harless, pastor of the First Presbyterian church, was in charge. The body was then sent to Zanesville, Ohio, for burial, and accompanied there by a representative of the Wasem Plaster Co. A number of gypsum men from the central west were there for the services.—*Ft. Dodge (Iowa) Messenger.*

John C. Eden Re-elected President of Reorganized Superior Portland

JOHN C. EDEN was chosen president, and Chester N. Reitze vice-president and general manager, at a meeting of the Superior Portland Cement, Inc., held at Seattle, Wash., recently. George E. Dickinson was elected secretary and Gordon Tongue treasurer and sales manager.

Recently the old company known as the Superior Portland Cement Co. was reorganized and practically the entire stock purchased by Bond, Goodwin & Tucker & Co., a banking house of Seattle and San Francisco. The old stock was then all retired and a new corporation, the Superior Portland Cement, Inc., was formed, with a capital stock of $6,000,000. Within a few hours after the new stock was open for purchase, the entire issue is said to have been oversubscribed, with the majority taken in Seattle, San Francisco and other coast cities.—*Concrete (Wash.) Herald.*

Gypsum Industry in Switzerland

THE following information on the gypsum industry in Switzerland sent us from the Gips-Union A. G., Zurich, Switzerland, is of interest. They say:

There are many deposits of gypsum in Switzerland located in the mountains of the country. Since the sale of gypsum is somewhat limited, it being used chiefly to supply domestic needs, only the best situated deposits are worked. The gypsum plants would produce much more of the finished products made such as plaster board, floor plaster, model plaster, etc., but the demand at home is lacking and there is no export trade that amounts to anything. A small amount of model plaster is imported from France but this, it is said, could easily be manufactured in Switzerland itself.

New Lime Plant to Be Built in Canada

THE Lakefield Lime Products, Ltd., Stony Lake, Ont., has been incorporated with a capital stock of $300,000 and will start work immediately on the erection of a plant to manufacture lime and chemical products. Plans include the erection of a rotary kiln of 25 tons capacity, a 15-ton hydrator and tunnel kiln and two ring roll mills for the manufacture of fillers used in the manufacture of rubber, paper, glass, paint, etc. The directors include: C. H. Ackerman, Peterborough; A. T. Lefevre, Pripre, Chile; J. W. Allan, Rochester, N. Y.; J. C. Strickland and C. E. Strickland, Lakefield, Ont. Officers are: president, C. H. Ackerman; managing director, C. E. Strickland; secretary-treasurer, J. C. Strickland; supervising engineer and chemist, Dr. Louis C. Jones, New York, and Frank A. Delisle, Buffalo.

Western Lime and Cement Company Holds Annual Elections

W. J. NAST and H. A. Nast were re-elected directors of the Western Lime and Cement Co. of Milwaukee, Wis., for the ensuing year at the recent annual meeting of the concern in Milwaukee.

The company had a very successful year and declared a handsome dividend, according to reports submitted at the meeting. Prospects in the building line for the coming year look very bright.

The concern's plant at Knowles, which was destroyed by fire during the last year, has been rebuilt into one of the most up-to-date plants in the country.—*Fond du Lac (Wis.) Report.*

Oregon To Increase Limestone Acreage

ACCORDING to a report from the Portland, Ore., *Oregonian,* the state of Oregon has taken lease on a royalty basis on 38 acres of land a few miles west of Dallas, Ore., belonging to A. M. Muck of Falls City, and will soon open a quarry thereon for the production of agricultural limestone. Extensive tests have been made recently by the representatives of the lime board to determine the depth of the lime deposit and it is stated that boring showed a depth of more than 100 ft. of rock.

The property taken over by the state joins the large quarries of the Oregon Portland Cement Co. of Oswego, which have been in operation for several years. It is understood that as soon as the state opens these new quarries the plant at Gold Hill will be abandoned.

Kelley Island Purchases Steamer "Hydro"

THE Kelley Island Lime and Transport Co. of Cleveland, Ohio, will soon put in service the steamer *Hydro,* recently purchased from the American Sand and Gravel Co. of Chicago. The *Hydro,* which is 172 ft. long with 46½ ft. beam and gross tonnage of about 1500 tons is to replace the seagoing dredge *Kelley Island* which capsized on May 2 of this year in Lake Erie.—*Cleveland (Ohio) Plain Dealer.*

Note: Details of *Kelley Island* disaster can be found in ROCK PRODUCTS, May 16.

Signal Mountain to Build Power Plant

THE Signal Mountain Portland Cement Co., Chattanooga, Tenn., is planning to build an electrical power plant in connection with its mill. The board of directors authorized the new project the latter part of November.

The company is now building six new concrete storage silos. Dust arresters and additional packing machines are being installed.

Experience with British "Ciment Fondu" Roads

ON at least two previous occasions we have noted some English experiments with "ciment fondu" (quick-hardening high alumina cement) as a binder for macadam roads. The following item from the *Contract Journal* of December 9, is the first report we have seen on the wearing qualities of these pavements:

"An interesting method of laying second-class roads was demonstrated recently in the borough of Gillingham (Kent). The Pier Approach Road, with a total area of 1,750 yards super, was Ciment Fondu bound instead of the macadam being water bound as previously. The metal, which was coated 3 in. thick, was Trevor granite 2¼-in. gauge. The grout was Thames ballast, sand mixed five parts to one part Ciment Fondu. The process employed was as follows: First the metal was rolled level in the usual way. Then the dry grout was spread on the surface, penetration being obtained by further rolling. The rolling was continued until all the voids were filled, more dry grout being added where necessary. Water was then sprayed on and the roller set to work again, sweeping proceeding at the same time, until the surface had a "slurry" appearance. The stretch of road so treated was then left to harden and at the end of 24 hours it was all ready for traffic, every piece of metal being firmly bound. The demonstration was under the supervision of Mr. John L. Redfern, engineer to the borough, and about 250 yards super were handled each day of the demonstration.

"It is worthy of mention that in September, 1924, when the idea of Fondu bonding was first mooted, the Gillingham Corporation had a small road treated in this way. Being an approach road to Chatham Dockyard this little road had to bear a great deal of traffic, but at the end of 15 months it is still perfect with no signs of corrugation, potholes, or any other weakness whatsoever."

Los Angeles Upholds Rules on Foreign Cement Imports

THE public works committee of the Los Angeles, Calif., city council recommended against eliminating any of the restrictions imposed by the city on the use of foreign cement on public work in Los Angeles.

The foreign cement interests asked that the council eliminate the requirement that foreign cement must be shipped in paper containers, which are placed in the regular shipping sacks. The elimination of these paper containers, it was maintained, would reduce the cost.

Inspector of Public Works Rock and Estimator Moyer of the city engineering department informed the committee that the price of cement and public work had dropped somewhat since the restrictions were placed on foreign cement.—*Los Angeles (Calif.) Examiner.*

New Lime Kiln at Bellefonte Almost Completed

IN spite of manifold obstacles, good progress is registered in the construction of the new kiln at the Bellefonte, Penn., plant of the American Lime and Stone Co., operated by the Charles Warner Co. of Wilmington, Del.

Placing of concrete foundations has been retarded by zero weather, cutting off water supply and by rainy weather, furnishing too much. Grading, relocation of railway track and excavation incident to these operations were also done under difficulties, but the kiln is in place and the work of lining well under way; the concrete bases for the motor and driving gear for the kiln are complete; the concrete tunnel connecting up this kiln with the rest of the plant is finished; the stack base and settling chamber are done, as well as the major part of the concrete walls for the building.

The producer excavations, about 15 ft. deep, are complete and the foundations are being poured.

Flowing water and rock encountered were troublesome. It may be necessary to resort to cofferdam protection in carrying down the "soaking pit" excavation, which reaches a lower level.—*Wilmington (Del.) Journal.*

Demand for Stone May Force Winter Operation Among Chicago District Producers

CRUSHED stone producers in the Chicago district predict that 1925 will establish a new record for shipments and consumption, both as pertains to local and outside territory. Demand for crushed stone for immediate use continues to hold up in good seasonal volume, but the market for outside carload shipments has slowed down, due to the close of the season for road work and the fact the country yards are not stocking heavily because of the taking of inventories.

It was reported that some of the big producers are planning to operate all through the winter months. A heavy demand is in sight with the starting of the 1926 building program, and with the present demand from the steel mills and the building industries still drawing heavily on storage piles the operators are planning now for ample stocks for the first quarter trade. The low price level reached during the year is the only complaint of the crushed stone interests.

Building material dealers are not anticipating any particular market features from now until along about the middle of January. Stocks in the yards are in good shape, and with the building lines now working on the winter schedule only a steady demand is expected for load-lots for immediate use.

This demand will be regulated by weather conditions to a great extent, and there were no indications recently of any changes in the situation which would develop sharp fluctuations in present price levels.—*Chicago Journal of Commerce.*

Census Bureau Needs Cooperation of Industries

THE Bureau of the Census is now engaged in collecting the data for the biennial census of manufactures, which will cover industrial operations during the calendar year of 1925. This census is required by an act of Congress approved March 3, 1919.

The schedules or questionnaires have already been mailed to all the manufacturers. The Bureau has issued the following instructions for correct answering of the questionnaires:

In preparing your schedules, care should be taken to answer each inquiry that applies to your operations. Do not combine items that are called for separately. If you cannot give exact figures, careful estimates will be accepted by the Census Bureau. In answer to Inquiry 6, the value of production, *not sales,* is called for. The sales during the year may considerably exceed or may fall considerably below the production during the year. Where no exact records of production are kept, the value of the production for the year may be ascertained by adding to the value of goods sold, the increase in the stocks of finished goods (or stocks in the process of manufacture) on hand at the end of the year as compared with the beginning of the year, or by deducting the decrease in such stocks from the value of goods sold.

We urge all rock products producers to cooperate with the Bureau of the Census in making the coming canvass in the shortest possible time and the most economical manner. These figures are published for the benefit of the manufacturing industry and the usefulness of census statistics is increased by making them available at an early date.

Adirondack Feldspar Corporation Acquires Maco Properties

THE Adirondack Feldspar Corp. of Albany, N. Y., has taken over all of the property, consisting of some 220 acres of feldspar deposit, private roadway, mills, etc., located at Wilton, N. Y., and heretofore owned by the Maco Development Co. The new organization, headed by men of experience is planning to operate the mine in a substantial manner, and the scheduled production is 200 tons of feldspar daily.

This deposit of 'spar is said to be of a very satisfactory quality, much of it being entirely free from iron oxide and will supply the requirements of both the ceramic as well as the stucco industry. A complete modern mill has been installed 2¼ miles from the mine and the spar is hauled by 2-ton trucks, each truck making ten trips every 8 hours. The mill is located on the Hudson Valley railroad, thereby providing good shipping facilities. The company has its own siding and can load four cars at once.

Simon Reynolds, a feldspar expert of many years experience, is general superintendent for the company, and a large force of miners and mill hands are now employed. The officers of the company are well known men of Albany, Schenectady and the office is located at 119 State street, Albany, N. Y.

Midwest Power Conference To Be Held in Chicago

THOUSANDS of power executives and engineers from all corners of the United States, particularly the middle-west—America's greatest power area—will assemble in Chicago the week of January 26 for the Midwestern Engineering and Power Exposition to be held in the American Exposition Palace.

This conference will bring together authorities of national reputation for a four day discussion of means whereby the available power resources of the country, especially of the midwest section, may best be developed for the benefit of the people and the industries. Speakers will outline the resources available, what has been and is being done to develop them and the probable future developments.

Other papers on the program will have to do with trends in practice to bring about better economy in production, better use of equipment and wider availability of power. There also will be presented summaries of the latest developments in utilizing oil and gas as sources of power.

Exhibits of special interest to power plant executives and engineers will include those of pulverized fuel equipment, diversified lines of recording instruments for boiler operation, power transmitting machinery, heating and ventilating equipment and valves of various types for high and low pressure.

Simultaneously and in the same building will be held the Midwest power conference, sponsored and endorsed by the local sections, regional and professional divisions of the engineering societies.

More Agricultural Lime Being Used in England

ONE of our English subscribers, who operates a lime plant, has sent us the following interesting information on the lime situation over there. He says:

"Before the war production of lime was confined to a few large producers, but, during the last few years quite a large number of smaller firms have sprung up and started operations particularly in the production of lime for agricultural purpose. This coincides with the farmers' lower purchasing power although the necessity for increased liming of land is appreciated all around."

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

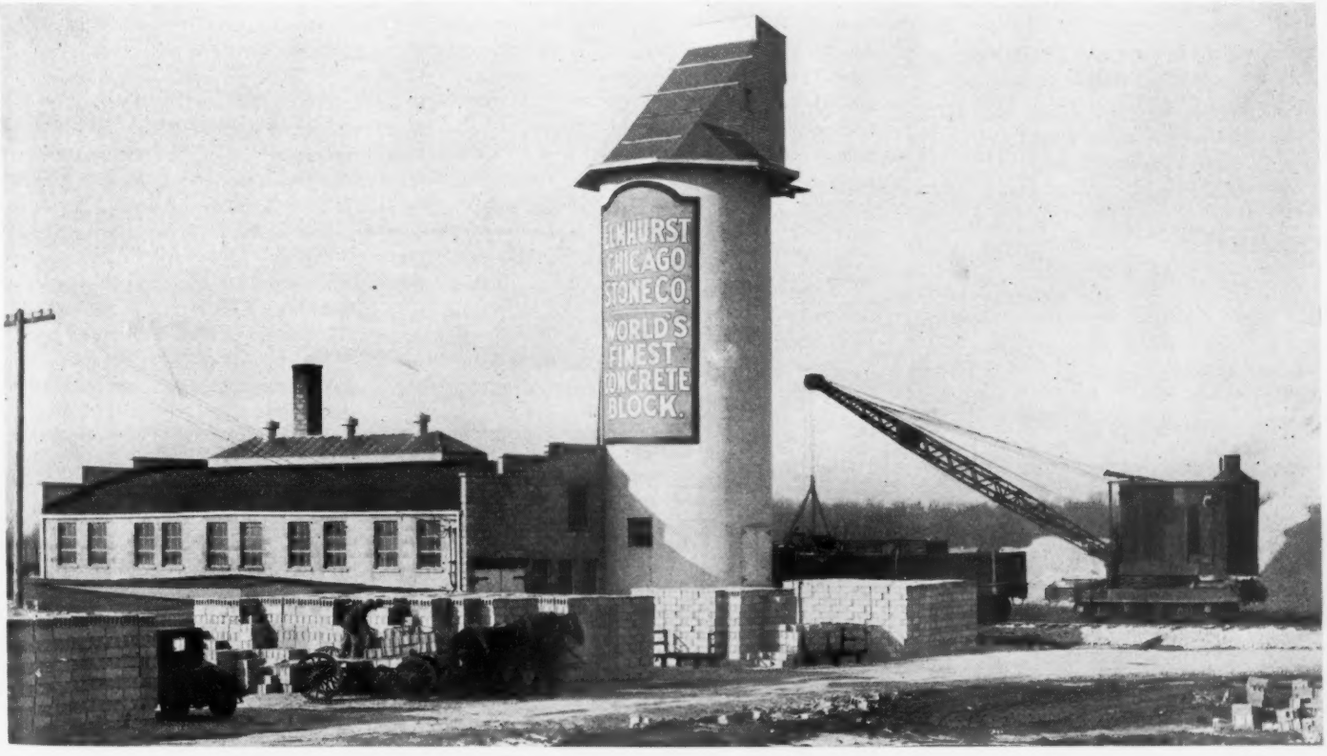
Cement Block Plant That Makes Screenings Yield a Profit

New 3000 Block Per Day Plant of Elmhurst-Chicago Stone Company the Culmination of Twenty Years of Expansion

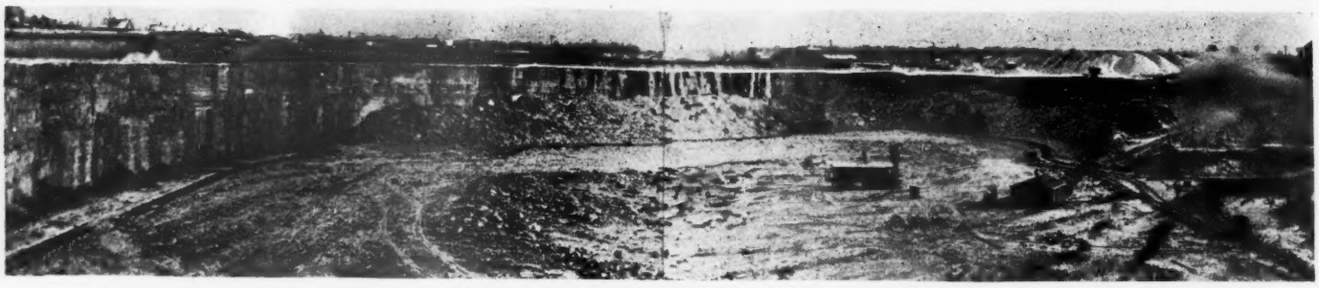
By R. F. Imler, Detroit, Manager, Thomas W. Noble & Co.

AUTHORITIES in the cement products industry have said that the new cement block plant, recently constructed by the Elmhurst-Chicago Stone Co. at Elmhurst, Ill., is one of the finest in the middle west. In its design every convenience is incorporated, tending to reduce manual labor, increase production and raise the quality of the product. The equipment throughout sets a high standard of cement block plant efficiency. In construction it is of the best possible materials and workmanship. No expense has been spared to make this a model cement block plant, and in its operation the ideal of the maximum number of block per man per hour is said to be realized with the minimum of effort.

The Elmhurst-Chicago Stone Co. is one of the largest producers of crushed limestone in the Chicago district. Its growth from its humble beginning 42 years ago to its present proportions, when upwards of 2000 yd. of crushed limestone and 3000 cement blocks are produced daily, is largely due to the business acumen of the Hammerschmidt family. In growth great credit is given to the late William Hammerschmidt, who met early adversity with unfaltering courage and who carried on with unshaken faith until, at the time of his death two



General view of the Elmhurst-Chicago Stone Co.'s new cement products plant at Elmhurst, Ill.; the concrete silo in the center holds seven carloads of aggregate



Limestone quarry of the Elmhurst-Chicago Stone Co., which has been operated continuously for over 40 years. Quarry face is 70 ft. high

years ago, the business structure he was so largely instrumental in creating had fully justified his effort.

At present, the business is administered by his near relatives. Richard Hammerschmidt, a brother, is president; George, a nephew, is vice-president, and Martin, his son, is treasurer.

The company owns 55 acres of land in the vicinity of Elmhurst, one of the western suburbs of Chicago. A tract of about five acres has been set aside for the cement block plant and storage yard. This land is underlaid to a depth of 250 ft. with limestone, which is remarkably free from clay seams or other impurities and is considered one of the best deposits in the middle west. To uncover this large deposit it is necessary to remove the top soil to a depth of about 14 ft. Stripping is accomplished with a ¾-yd. Osgood steam shovel, the dirt being loaded into Kilbourne and Jacobs side dump cars and hauled to a neighboring marsh.

The present floor of the quarry is approximately 70 ft. below the surface. The accompanying illustration gives some idea of the magnitude of the quarrying operations that are carried on at Elmhurst. Two steam shovels, a No. 73 Osgood and a 70-C Bucyrus, each equipped with a 2½-yd. bucket, are constantly employed on the floor of the quarry loading the rock into specially constructed 5-yd. side-dump cars, which are hauled to an inclined track by two Whitcomb gasoline locomotives. Loaded cars are hauled by cable up this inclined track where the contents are dumped by an air hoist into a 36-in. McCully crusher, which reduces the stone to 8 in. and smaller. Crushed material descends from this crusher on two Stephens-Adamson 30-in. belt conveyors, which carry it to two separate plants for further reduction and final screening.

In the production of the grades of stone desired for road and building construction, a surplus of fine material necessarily is made. In order to turn this surplus (screenings) into a product which would be commercially profitable, the manufacture of cement block was begun about 20 years ago. At first, only hand machines were used, then as the market for the product developed and the business grew more profitable, power equipment was added.

In the spring of 1924 a Universal "standard block maker" was installed in the old building, which even then was proving inadequate for the volume of business being done. The quality of the block produced and the excellent service given by the company created such a demand for the product that it was manifest that a new and larger plant was a necessity.

The Universal "standard block maker" furnished by Thomas W. Noble & Co., Chicago, Ill., having proved satisfactory, the Elmhurst-Chicago Stone Co. chose this company to design and equip the new plant. The factory building was constructed by Balgemann and Schultz, Elmhurst, general constractors. The plans were prepared by R. F. Imler of the Thomas W. Noble and Co.

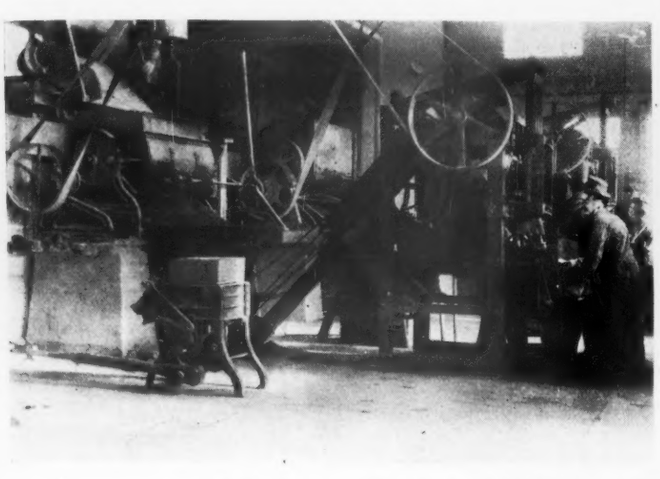
New Plant Built of Own Product

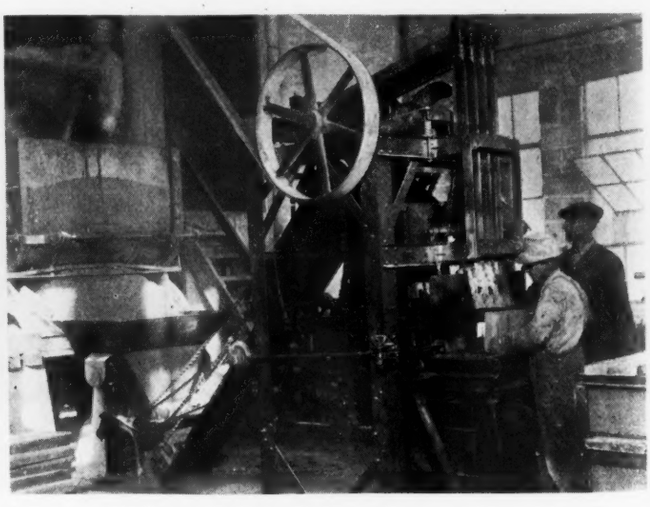
The entire plant is of cement block construction. All the blocks were manufactured in the company's own plant. Panel faced block were used and the building presents an exceptionally attractive exterior, as may be seen in the illustration.

A description of the plant falls into three main divisions, one dealing with the workroom proper, one with the steam-curing facilities and the third with aggregate storage.

Upon entering the main workroom the visitor is impressed by its unusual roominess and the excellent lighting facilities. This room is 46x65 ft. with 12 ft. side walls, and as the roof is carried on frame trusses, the floor space is unobstructed by supporting posts. In addition to windows on all four sides of the building, light is obtained from a large skylight extending over half the length of the workroom. The use of artificial light is almost never required during the ordinary working hours, for the interior of the building is flooded with day light.

Along the rear wall of this workroom and extending under the storage bin is a reinforced concrete cement storage and charging platform 15 ft. wide and 7 ft. above the floor level. A portion of the space under the platform is used as a boiler room and coal bin. This space also accommodates a





Left—Mixer and "block-maker" in operation. Right—Removing blocks from "stripper"

shop lavatory. The remainder of the space, about 37 ft. in length, is used for the manufacture of concrete sills, steps and trim stone.

A large storage bin is one of the special features of this plant. It is a cylindrical reinforced concrete structure 50 ft. in height with an inside diameter of 18 ft. This bin has a capacity of approximately seven carloads of aggregate and was erected by W. H. Warford Construction Co. of Aurora, Ill.

The storage bin is divided into four compartments by two vertical partition walls placed at right angles to each other in the form of a cross, making the horizontal cross section of each compartment the quarter sector of a circle. This arrangement of the partition walls makes it possible to have the four openings of the separate compartments very close together at the bottom of the bin to facilitate regrading of the aggregate. The exterior of this bin has been painted with Medusa white cement paint and a large sign advertising the company's products has been painted on it.

The storage bin is also arranged for the installation of steam coils to prevent freezing of the aggregate in the winter time. These steam coils have not as yet been installed, because it is not certain that they will be required.

Steam curing rooms are arranged in two tiers running laterally. There are eight of these rooms, each 13 ft. in width and 20 ft. in length. The capacity of each curing room is about 450 blocks. A central passageway runs between the two tiers of curing rooms. The main steam lines run down the central passageway and from these lines laterals enter each room. The passageway is lighted by electric lights and the steam pipes are covered with asbestos pipe covering.

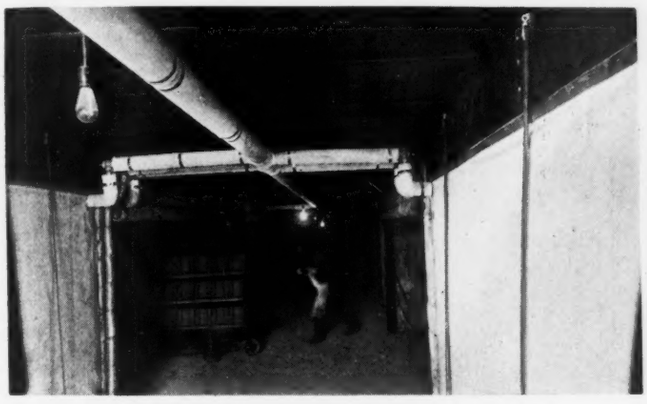
An up-to-the-minute method of curing the block is used in this plant. The steam as it comes from the boiler is introduced into cast iron radiators, which are located along the sides of the curing rooms. In each of the radiators are openings through which live steam is allowed to escape. In this way good conditions for the curing of the cement products are maintained. The radiators raise the temperature of the curing rooms to 110 to 125 deg. F. By permitting steam to escape in the curing room a warm, moist atmosphere essential for proper curing is assured.

On the ground level, around the quarry, there is an extensive, privately owned and operated track system. This system is used for delivery of the various grades of concrete aggregate to the railroad, for hauling away stripping from the surface of the quarry and to deliver aggregate to the new block plant. A 15 hp. Whitcomb gasoline locomotive and an Orton & Steinbrenner locomotive crane are used for moving freight cars over this system.

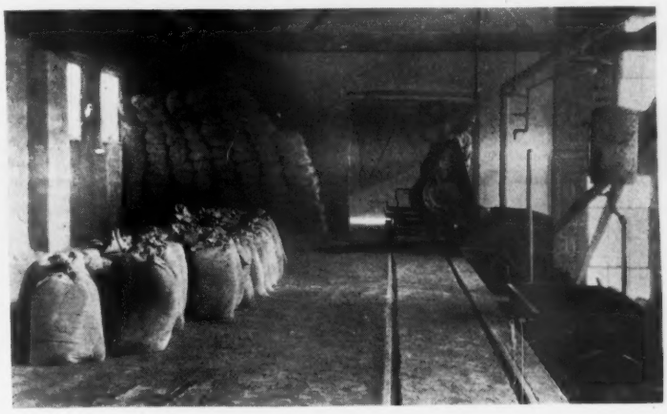
The screenings used in the block plant are delivered from the bin located at the screening plant into gondola cars, which are placed on the track at the rear of the plant. These cars are unloaded by the locomotive crane, a clamshell bucket delivering the material to the boot of a bucket elevator. This method of delivering screenings to the plant is only temporary, as a track hopper with apron feeder has been designed for this purpose and will be installed next spring.

The aggregate is elevated to the top of the large storage bin by a bucket elevator driven by a 10 hp. electric motor. This elevator was furnished and installed by the Stephens-Adamson Co. The buckets are mounted on a 12-in. leather belt. At the top of the storage bin a system of sliding chutes is so arranged that aggregate can be delivered to any one of the four compartments desired.

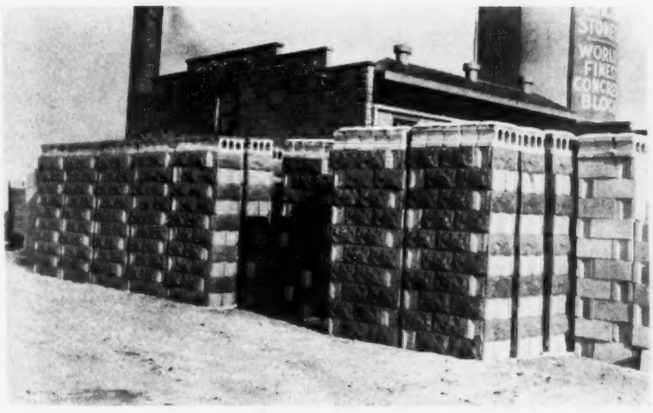
The bottom of the bin is equipped with four sliding bin gates. Although at the present time screenings used in the manufacture of concrete block range from ½ in. down to dust, the bin is so arranged that at some future time these screenings can be graded into three or four different sizes, such as



View of gallery between steam-curing room; note canvas curtains used to close individual rooms



Cement storage and charging platform



Finished cement blocks stored in yard and ready for shipment

One of the lateral runways in the storage yard

½ in. to ¼ in., ¼ in. to ⅛ in. and from ⅛ in. to dust and then regraded, using such proportions of each grade as will give the maximum strength to the block.

Aggregate descends by gravity through the bin gates into a ¾ yd. Chase dump car, operating on the charging track. The inside of this car is marked to guide the mixer man in loading the correct amount of aggregate. When the car has been loaded it is run out on the charging track where a bag of cement is placed in it.

Cement in sacks is received in two cars, which are spotted at the rear of the plant. The track at the rear of the plant is elevated so that the floor level of the car is the same as the level of the cement storage platform. The cement is taken from the car and trucked into the plant. The fact that both the car and the cement storage platform are on the same level greatly facilitates the unloading of cement. Medusa portland cement is used for the blocks and Medusa white cement is used for facing block and Medusa waterproofing is put into the facing mixture.

The cement storage and charging platform has a capacity of four carloads of cement in sacks. On it is installed a Handy sack cleaner and baler.

A distinct advantage of a platform of this kind is that all of the dust incident to the handling of cement is confined to one place in the plant and since it is above and to the rear of the men working around the machines on the floor level, the space can be aired without inconveniencing them.

Work of charging the mixers is greatly facilitated by the design of the cement storage platform. Along the front edge of the platform a 24-in. gage track is laid upon which the dump car used to charge the mixers runs. This is filled with aggregate as it stands on the track under the storage bin. It is then moved out along the track until it is just to the rear of the mixer to be charged. There a bag of cement is placed in it and the mixer charged by dumping it.

With this arrangement one mixer man easily cares for three 14 ft. mixers. Concrete materials are mixed for about two minutes before water is turned into the mixers. The water line extends over the mixers, each of which is equipped with a valve to regulate the flow.

It is the intention to equip each of the mixers with an automatic water measuring tank, and experiments are now being conducted with that end in view. At the present time the visual method of judging the consistency of the concrete is used.

Concrete used for the Universal stripper machine is mixed in a 14 ft. Ideal concrete mixer. A 14 ft. Blystone mixer is installed at the rear of the "Heavy Duty Block Maker." The mixed concrete is discharged from both of these mixers through side door discharges and descends into the feeding hoppers at the foot of the elevators on the respective machines. These feeding hoppers are equipped with a reciprocating feeding device that supplies the concrete to the elevator gradually and prevents the elevator from stopping or stalling. Elevators on the Universal machine are of the scraper flight type and are controlled from the front of the machine by the operator. The mixed concrete is elevated to a feeding hopper on the machines.

Blocks are made on two Universal machines, a "Heavy Duty Blockmaker" and an "Automatic Stripper." A third machine, another "Heavy Duty Blockmaker," has been purchased and will be installed early in 1926. These machines are the result of study and experimentation on the part of Universal engineers, carried on with a view of perfecting a rugged machine, capable of meeting the service conditions imposed upon it by rapid, continuous manufacture of high quality cement block.

The "Heavy Duty Block Maker" is used for making face block. Corner block and other specials are made on a hand machine, as it is not deemed efficient to tie up a high production machine on work of this sort, which is so largely a hand process.

The operation of making the block on the down face machine follows: First a wooden pallet is placed in the machine and the mold box closed. The locking bars then fall into lugs provided for them. The cores are inserted with a hand lever and the feeding drawer, carrying the finishing plate, moves forward over the mold box. The feeder is put in operation and the foot lever at the right of the machine is decreased, causing the tampers to fall. When the block is made the feeding drawer moves back and the tamp bars are allowed to descend on the finisher plate. The foot lever is then released, hanging up the bars. The block is then removed from the mold box by a single movement, pivoting upward and outward.

The average daily production of the "stripper" is 1600 8x8x16-in. block per 8-hour day, and the production of the "block maker" is approximately 1200 per day. With the addition of a third "block maker" the production of this plant will be approximately 4000 units per day.

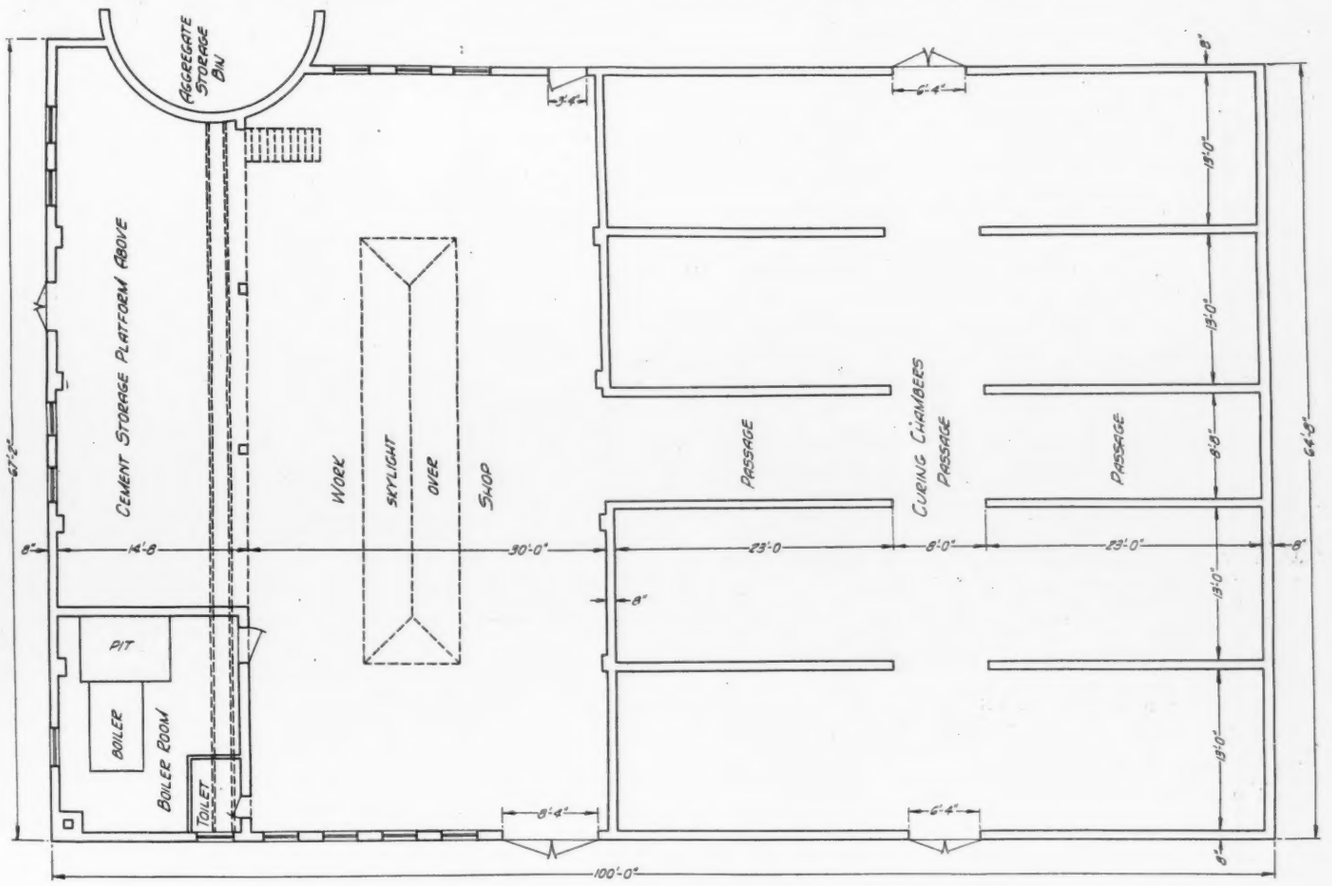
In the old plant the track and car system was used for transporting the finished block to the steam curing room and from there to the storage yard. The company had several of their old steel cars on hand when they began the construction of the new plant. They removed the steel frames from the car trucks and riveted four pieces of channel iron on them for legs and thus converted them into steel racks ideal for use with a lift truck. A special Barrett lift truck, with spring frame and rubber tires, to be used with the converted steel racks, was supplied by the Thomas W. Noble and Co. In this way the company was able to conserve their steel cars and at the same time enjoy the advantages of the lift truck system in the new plant. A second Barrett lift truck with steel wheels is used to convey the cured block from the steam rooms to the storage yard. This truck operates over a system of concrete runways which consists of a main runway encircling three sides of

Old plant, established 20 years ago, and only recently replaced by the modern structure pictured

Plant operating personnel. At the extreme right, Otto Speckman, foreman

the plant and numerous spaced laterals which serve the double purpose of reducing the carrying distance when unloading block and of making it possible to keep the main runway unobstructed while unloading block.

The plant is manned by a crew of 10 men. Otto Speckman, foreman, has been in the employ of the Elmhurst-Chicago Stone Co. for the past seven years. His knowledge and ability have been largely responsible for the development of the smooth working organization operating the plant. Of the remaining nine men, one charges and operates the mixers, two operate the machines, two off-bear the finished block, two operate the lift trucks, one is engaged in the manufacture of special block by hand and one is a general utility man, firing the boiler, piling block in the storage yard and helping on other operations as occasion requires.



General plan of the Elmhurst-Chicago Stone Co.'s cement products plant

Concrete Products Output Shows Trend Toward More Durable Building

ESTIMATES compiled for 1925 indicate that not less than 600,000,000 concrete blocks will be used to build structures of all types in this country. Concrete brick sales also show a large increase, this year's production reaching a total of some 300,000,000 brick. Other concrete products such as concrete sewer pipe, lamp posts, garden furniture, silo staves, culverts and tile show corresponding increases in adoption, according to A. J. R. Curtis of the Portland Cement Association.

"Since the war," Mr. Curtis declares, "production of all concrete units has increased many hundred per cent. Concrete block, as an example, has increased its sales from 50,000,000 units in 1920 to 468,000,000 units in 1924. In 1924 the American public spent more than $85,000,000 for concrete block and it is estimated that more than $100,000,000 has been spent for concrete block in 1925.

"Not many years ago rural construction where the user made his own block in home-made molds pretty nearly circumscribed the field of usage. Today there are millions of dollars of capital invested in high type manufacturing plants and production and sales have been put on an equal basis with other large modern industries.

"Not only houses and barns, but schools, industrial plants, store buildings, office buildings, churches and many other types of structures are being built of concrete masonry. New uses are coming thick and fast, so fast, indeed, that the industry is hard put to keep pace with the demand during the construction season.

"A survey recently concluded shows that concrete products manufacturers are today making many new and specialized types of units. Partition tile and block, floor tile, roofing tile, floor slabs and beams, posts, conduits and many other special products are being manufactured to meet the requirements of users.

"Machinery has replaced hand labor and special machines designed to insure uniformity are in general use. Plants representing hundreds of thousands of dollars worth of machinery and prosperity are replacing the one man shops of the past.

"There has been a noticeable trend of late toward a widespread revision of local building codes to give concrete products an equal standing with older materials. The Underwriters' Laboratories have given concrete block a two-hour fire rating. Concrete block have brought the hollow air space type of wall into great favor as the best wall for home building.

"Building materials figures show that usage of concrete building block and tile has within the last five years increased from about .48 block per capita to above 5.44 block per capita. To supply this tremendous demand some plants have been forced to work day and night during 1925. Several more plants climbed into the million block per year production class.

"The great interest now being manifested in portland cement stucco with its nnmerous varied colors and textures has been reflected in the demand for masonry walls to carry the stucco. Architects, contractors and home builders have taken a most noticeable interest in this latest development of American home building," states Mr. Curtis.

Current Market Prices of Cement Products

Concrete Block

Prices given are net per unit, f.o.b. plant or nearest shipping point

City of shipping point	Sizes 8x8x16	8x10x16	8x12x16
Camden and Trenton, N. J	.....	.19‡	.30‡
Columbus, Ohio	.16@.18a	.....	.....
Detroit, Mich.	16.00*	.....	26.00*
Forest Park, Ill.	18.00*	23.00*	30.00*
Graettinger, Iowa	.18@.20	.....	.....
Indianapolis, Ind.	.13@.15†	.....	.....
Los Angeles, Calif.	4x3½x12—.03;	6x3½x12—.04½;	8x3½x12—.05½
Oak Park, Ill.	.18@.21a	.....	.....
Somerset, Pa.	.20@.22	.....	.....
Yakima, Wash.	20.00*	.....	.....

*Price per 100 at plant. †Rock or panel face. (a) Face. ‡ Delivered.

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	25.00@35.00
Baltimore, Md. (Del. according to quantity)	15.50	22.00@50.00
Camden and Trenton, N. J.	17.00	
Ensley, Ala. ("Slagtex")	14.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Friesland, Wis.	22.00	32.00
Longview, Wash.	18.00	25.00@50.00
Milwaukee, Wis.	15.00	25.00@45.00
Mt. Pleasant, N. Y.		14.00@23.00
Omaha, Neb.	18.00	30.00@40.00
Pasadena, Calif.	12.50	
Philadelphia, Penn.	†15.25	‡21.50
Portland, Ore.	15.00@17.00	25.00@150.00
Prairie du Chien, Wis.	14.00	22.50
Rapid City, S. D.	18.00	25.00@50.00
Waco, Texas	16.50	32.50@125.00
Watertown, N. Y.	21.00	35.00
Wauwatosa, Wis.	14.00	20.00@42.00
Winnipeg, Man.	14.00	22.00
Yakima, Wash.	22.50	

†Gray. ‡Red.

Current Prices Cement Pipe

Prices are net per foot f.o.b. cities or nearest shipping point in carload lots unless otherwise noted.

Culvert and Sewer	4 in.	6 in.	8 in.	10 in.	12 in.	15 in.	18 in.	20 in.	22 in.	24 in.	27 in.	30 in.	36 in.	42 in.	48 in.	54 in.	60 in.
Detroit, Mich.								$14.00 per ton									
Graettinger, Iowa	.04½d	.05½	.08½	.13	.17½	.....	.50	.60	.75	.85	.....	.....	.....	.....	.....	.....	.....
Grand Rapids, Mich. (b)	.....	.....	.....	.60	.72	1.00	1.28	.....	.....	1.92	2.32	3.00	4.00	.....	.....	.....	.....
Houston, Texas	.....	.19	.24	.43	.55½	.90	.130	.....	†1.70	2.20	.....	.....	.....	.....	.....	.....	.....
Indianapolis, Ind. (a)	.....	.....	.....	.80	.90	1.10	1.30	.....	.....	1.70	.....	2.70	.....	.....	.....	.....	.....
Longview, Wash.						Sewer pipe 40% off list, culvert—list											
Mankato, Minn. (b)	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	1.75	2.50	3.25	4.25	.....	.....	.....
Mt. Pleasant, N. Y.	.....	.17	.26	.39	.50	.68	.93	1.29	.....	1.67	.....	.....	.....	.....	.....	.....	.....
Norfolk, Nebr. (b)	.....	.....	.....	.90	1.00	1.13	1.42	.....	.....	2.75	.....	3.25	5.00	.....	.....	.....	.....
Paullina, Iowa‡	.....	.....	.....	.....	.....	.....	.....	2.25	.....	2.11	.....	2.75	3.58	.....	6.14	.....	7.78
Somerset, Pa.	.....	.....	.....	.....	.80[1]	1.00[2]	1.40[3]	.....	.....	2.00[4]	.....	3.25[5]	4.00[6]	6.00[7]	.....	.....	.....
Tacoma, Wash.			4 in. to 18 in.			15 to 90 cents per foot											
Tiskila, Ill. (reinforced) (a)	.....	.....	.....	.65	.75	.85	1.10	1.60	.....	1.90	.....	.....	3.40	.....	.....	.....	.....
Wahoo, Nebr. (b)	.....	.....	.....	.....	1.00	1.13	1.42	.....	.....	2.11	.....	2.75	3.58	4.62	6.14	6.96	7.78
Waukesha, Wis.					4-in. to 24-in.—8.00 per ton												
Yakima, Wash.					$10.00 per ton												

*30-in. lengths up to 27-in. diam., 48-in. lengths after: (a) 24-in. lengths; (b) Reinforced; (c) Interlocking bar reinforced.
†21-in. diam. ‡Price per 2 ft. length. (d) 5 in. diam. [1]@1.08. [2]@1.25. [3]@1.65. [4]@2.50. [5]@3.85. [6]@5.00. [7]@7.50.

Cement Tile

Prices are net per sq. in carload lots, f.o.b. nearest shipping point unless otherwise stated.

	Hawthorne tile, per sq.
Cicero, Ill.	
Red Spanish	10.00
Green Spanish	12.00
Red French	9.50
Green French	11.50

	—Cicero— Red	Green
Ridges	.25	.35
Hips	.20	.30
Ridge closers	.05	.06
Hip terminals, 3 way	1.25	1.50
Hip starters	.50	.60
Gable finials	1.25	1.50
Gable starters	.20	.30
End bands	.20	.30
Eave closers	.06	.08

	Camden and Trenton, N. J.—8x12, per sq.
Red	15.00
Green	18.00
Cement City, Mich. — 5"x8"x12", per M	55.00
Chicago, Ill.—per sq.	20.00
Detroit, Mich.—per 100	70.00
Grand Rapids, Mich.:	Per 1000
5x4x12	45.00
5x8x12	70.00
5x8x 6	35.00
Graettinger, Iowa.—Cement tile per 100 ft.	
5-in.	4.50
6-in.	5.50
8-in.	8.50
10-in.	12.50
12-in.	17.50
14-in.	22.50
16-in.	30.00
18-in.	35.00
20-in.	40.00
22-in.	45.00
24-in.	50.00
Houston, Texas.—Roofing Tile, per sq.	
Red	17.00
Green	19.50
	Per 1000
5x4x12 (Lightweight)	45.00
5x8x12 (Lightweight)	80.00
Indianapolis, Ind.—9"x15"	
Gray	10.00
Red	11.00
Green	13.00
Longview, Wash.—(Stone Tile)	Per 1000
4x6x12	60.00
4x8x12	65.00
Mt. Pleasant, N. Y.:	Per 1000
5x8x12	78.00
Pasadena, Calif.:	Per 1000
4x4x12	$30.00
4x6x12	50.00
4x8x12	60.00
Waco, Texas:	Per sq.
4x4	.60
Wildasin Spur, Los Angeles, Calif:	
4x3½x12	.03½
6x3½12	.04½
8x3½x12	.05½
Yakima, Wash.:	
5x8x12	.10

Improving Testing Methods for Concrete Aggregates

AT a recent meeting of the mineral aggregate committee C-9 of the American Society for Testing Materials, it was recommended that the sub-committee on laboratory tests for concrete standardize a cross bending-test with the view of developing a worth-while field test of concrete.

It was suggested that the sub-committee on field tests obtain cores of different diameters from laboratory-made concrete to determine more certainly the relation of size of core to size of aggregate in its effect on crushing strength.

It was agreed that the sub-committee on specifications and tests for aggregate be asked to prepare a review of existing specification requirements and tests for concrete aggregates, with a view to clarifying the present status of such specifications and tests.

It was recommended that the sub-committee on available aggregates revise the form presented last year for recording data on deposits of sand and gravel so as to cover all types of aggregates and to include therein a reference to the standard methods of sampling stone, slag, etc.

The sub-committee on deleterious substances in concrete, it was felt, should make further tests of the effect of organic impurities to include long-time tests in order to establish more definitely whether such impurities effect a permanent reduction in strength; also the relative effect of such impurities on high testing and low testing cements, mixed in different consistencies and proportions.

The work of the sub-committee on admixtures would be continued as well as the work of the sub-committee on condiitons affecting durability of concrete in structures, the latter having to do with the study of accelerated tests.

New Concrete Brick Plant To Use Limestone Screenings

THE CARBON CONCRETE Brick Co., a subsidiary of the Carbon Limestone Co., is preparing to build a brick plant in connection with its present property near Hillsville. The new plant will manufacture its product from limestone screenings and cement, a combination said to make a superior building material. A plant with a capacity of 50,000 bricks per day will be constructed. The company has received a charter from the state of Ohio, with the following incorporators: Robert Bentley, Fred O. Earnshaw, Harmon T. McCartney, Herbert W. Feather and Mary S. Logan.—*Philadelphia (Pa.) Inquirer.*

How National Trade Associations are Governing Industry

LEGISLATURES and courts ultimately will be superseded by industrial agencies in the handling of industrial problems, the December issue of *The Nation's Business,* official organ of the U. S. Chamber of Commerce, is said in an article by P. G. Agnew, secretary of the American Engineering Standard Committee, entitled "How Business Is Policing Itself."

Many of the industrial issues now under consideration of courts, legislatures and commissions not only can be solved by industry itself, but much more has already been accomplished in this direction through non-legal methods than business men themselves realize, Mr. Agnew declares. By setting up through co-operative action certain national standards of production, materials and methods, the various industries will eventually forestall the necessity of either courts or legislatures dealing with most industrial problems, thus checking the flood of legislation which is becoming a matter of national concern.

Standardization Helps Self-Government

This movement toward industrial self-government, according to Mr. Agnew, has reached its highest development to date in the realm of standardization, where industrial problems are solved through co-operation rather than through legal channels. The various industries, by working out standards acceptable to all parties interested, establish their own "laws," thereby obviating disputes and subsequent litigation and legislation. This "statutory" method of the industries in regulating their own affairs thus eventually will take the place of legal methods, just as legislation by statute has been supplanting the common law process of making laws. This manner of industrial self-government and its advantages are described as follows:

"The reaching of a national consensus on an industrial problem, through the statutory-law process, is an extremely difficult matter, the more so that legislation on nearly all such subjects comes within the jurisdictions of the legislatures of the 48 states. Since few, if any, members of a legislature have adequate knowledge of such a problem, the initiative and the general direction of legislative movements of the kind are in the hands of interested people outside the legislature—in short, in the hands of the lobby.

Must Get Industry Away from Politics

"In the legislative mill most specialized problems get lost in the game of partisan politics over popular issues. In nearly all cases, the overwhelming majority of people are necessarily ignorant both of the existence of the problem and of the attempted legislative solution. To a large extent the same is true of the legislators themselves. With such conditions in each state, anything approaching national uniformity becomes extremely difficult, often impossible.

"The legislative method, in short, is not a suitable one for the solution of innumerable specialized and more or less technical problems that arise in the development of industry and business. It does not reflect upon either the ability or the probity of legislators as such any more than the statement that hammer, chisel and saw are not suitable tools for the making of watches reflects upon either the ability or probity of carpenters as a class."

Purchase specifications, methods of test, nomenclature and dimensional standardization to secure interchangeability of supplies and to further mass production are all included in the work of the Standards committee.

Economic Law Must Govern

"While the chief advantage to industry in the formulation of standards for its own guidance is the great economies which they make possible through mass production and the resulting simplification in the processes of distribution, there are many other advantages, among them being the reduction of causes for litigation. The facts are made so plain that there is no occasion for going to law, as disputes do not arise."

It is explained that there are now national standardizing bodies in all the more important industrial countries, 19 altogether, all but one of which have been organized during or since the war. "More than 250 national organizations are officially co-operating in the work of the American body, the American Engineering Standards Committee."

"Each project is in the hands of a joint committee made up of representatives of all interested groups. In a very real sense each of these joint committees is a miniature industrial legislature, organized upon an industrial rather than upon a political or geographical basis, and engaged in the development of a standard or 'code' for the guidance of industry.

"The whole movement is based upon the principle that purely industrial standards should not be subject to legislative or other legal control, or to governmental pressure of any kind, but that they should be developed and applied through voluntary, systematic co-operation of the industries themselves, though always with the full co-operation of any and all governmental agencies concerned, but on precisely the same basis as that of any other interested group."

This article furnishes a specific application of the general principles frequently urged by Mr. Hoover and emphasized by President Coolidge in his recent address before the New York Chamber of Commerce, when he stressed the "desirability of the largest possible independence between government and business."

Lime Dust Not Harmful

DR. W. A. EVANS, the well known health expert, contributes the following on the effects of lime dust on health in his regular daily article in the *Chicago Tribune:*

Working in lime dust may not be very pleasant and it may not promote pulchritude, but it is not harmful to health. The owners of limestone works have long been of that opinion. The workers have generally shared the opinion. In communities where quarrying and fabricating limestone is a prominent industry, there are always people who tell of consumptives cured by inhaling lime dust as well as the low prevalence of the disease.

A fair amount of evidence in support of these legends is being accumulated by close, careful investigators. Dr. Izard finds that lime dust is harmless to the lungs, especially when it is reasonably free from mixture with sand dust and other dusts. For this there are several reasons. The dust particles are rounded.

The most harmful of dusts are those with cutting edges and sharp points. Lime dust particles have a way of running together through which they are converted into still less harmful small masses. The particles attract certain large cells to the tissues of the lungs. These macrophages are protective.

Finally, the lime is in part soluble in the fluids of the lung. That which goes into solution is either absorbed or coughed up. The American diet is apt to be a little deficient in lime. In consumption there is some lime starvation. When lime dust is inhaled some of the lime is dissolved, absorbed and stored in the organs which store lime, the teeth, bones, lungs, and kidneys.

Therefore, there is a little ground for the common notion that consumptives who inhale lime dust are somewhat benefited thereby. It may be true that a lime worker who develops consumption stands a better than average chance to recover. There are said to be four million men who work in very dusty air in the United States.

Dr. C. E. A. Winslow has proved that about four very dusty trades are responsible for the excess of consumption which is found among laborers. The harmful dusts are those which are rich in sharp edged particles composed principally of sand or silica and metal. Of the four million who work in very dusty air, about one hundred and sixty thousand work in lime dust. In the main these are plasterers, whitewashers, operatives of lime kilns, workers in lime and cement, stone cutters and quarry men who work with limestone.

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F.O.B., at producing point or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Carey, Ohio	.65@ .75	.90@1.10	.85@1.00	.80@ .90	.80@ .90	.80@ .90
Chaumont, N. Y.	.50	.....	1.75	1.25	1.25	1.25
Chazy, N. Y.	.75	1.65	1.65	1.40	1.40	1.40
Cobleskill, N. Y.	1.50	1.35	1.25	1.25	.....	.....
Eastern Pennsylvania	1.35	1.35	1.35	1.35	1.35	1.35
Frederick, Md.	.50	.75	1.30	1.20	1.10	1.10
Munns, N. Y.	1.00	1.40	1.40	1.40	1.25	.....
Northern New Jersey	1.60	1.50@1.80	1.30@2.00	1.40@1.60	1.40@1.60	.....
Walford, Penn.	1.00	1.30	.....	1.50h	1.50h	.....
Watertown, N. Y.	.50	.....	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Afton, Mich.	.....	.....	.....	.....	.50	.....
Alton, Ill.	1.75	.....	1.75	.....	.....	.....
Bloomville, Middlepoint, Dunkirk Bellevue, Waterville, No. Baltimore, Holland, Kenton, New Paris, Ohio; Monroe, Mich.; Huntington, Bluffton, Ind.	1.00	1.10	1.10	1.00	1.00	1.00
Buffalo, Iowa	1.20	.....	1.35	1.15	1.20	1.20
Chasco, Ill.	.....	1.15	1.15	1.15	1.15	.....
Columbia, Krause, Valmeyer, Ill.	1.00@1.50	1.20@1.25	1.20@1.25	1.20	1.20	1.50
			Flux all at 1.30			
Cypress, Ill.	1.15	1.15	1.15	1.15	1.05	1.00
Gary, Ill.	1.00	1.37½	1.37½	1.37½	1.37½	1.37½
Greencastle, Ind.	1.25	1.15	1.15	1.05	.95	.95
Lannon, Wis.	.80	1.00	1.00	.90	.90	.90
Milltown, Ind.	.....	.85@1.00	.75@ .90	.85@1.00	.85@ .90	.85@ .90
Northern New Jersey	1.30	.....	1.80	1.60	1.40	.....
River Rouge, Mich.	1.10	1.10	1.10	1.10	1.10	1.10
Sheboygan, Wis.	1.10	1.10	1.10	1.10	1.10	.....
St. Vincent de Paul, Que.	.85	1.35	1.05	.95	.90	.90
Stone City, Iowa	.75	.....	1.10†	1.05	1.00	.....
Waukesha, Wis.	.90	.90	.90	.90	.90	.90
SOUTHERN:						
Allgood, Ala.			Crusher run, fines out, for flux, 1.00 per net ton			
Cartersville, Ga.	1.65	1.65	1.65	1.15	1.15	1.15
Chico, Texas	.90	1.35	1.35	1.25	1.20	1.10
El Paso, Texas	1.00	1.10	1.00	1.00	.....	.....
Ft. Springs, W. Va.	.50	1.60	1.50	1.35	1.25	.....
Graystone, Ala.			Crusher run fluxing stone, 1.00 per net ton			
Henderson, N. C.	.....	.....	1.50	.....	1.25	.....
New Braunfels, Texas	.50@ .60	1.00@1.20	1.00@1.20	.80@1.00	.75@ .90	.75@ .90
Olive Hill, Ky.	.50@1.00‡	1.00	1.00	1.00	1.00	1.00
Rocky Point, Va.	.50@1.00	1.40@1.60	1.30@1.40	1.15@1.35	1.10@1.20	1.00@1.05
WESTERN:						
Atkinson, Kans.	.25	2.00	2.00	2.00	2.00	1.60‖@1.80
Blue Springs & Wymore, Neb.	.25	1.45	1.45	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25	.....	1.25	1.25	1.00	.....
Kirkfield, Ontario	70	1.05	.90	.90	.90	.90
Rock Hill, St. Louis county, Mo.	1.35	1.35	1.35	1.35	1.35	1.35

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.60	1.70	1.45	1.20	1.05	1.05
Duluth, Minn.	.90	2.25	1.90	1.50	1.35	1.35
Dwight, Calif.	1.00	1.00	1.00	.90	.90	.....
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
Knippa, Texas	2.50	2.00	1.55	1.40@1.50	1.25	.....
New Haven, New Britain, Meriden & Wallingford, Conn.	.60	1.70	1.45	1.20	1.05	1.05
Northern New Jersey	1.80	2.00	1.80	1.40	1.40	.....
Oakland and El Cerritto, Cal.	1.00	1.00	1.00	.90	.90	.....
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	.....
Springfield, N. J.	1.70	2.10	2.10	1.80	1.80	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	1.10

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley, Montello and Red Granite, Wis.—Granite	1.80	1.70	1.50	.....	1.40	.....
Coldwater, N. Y.—Dolomite			1.50 all sizes			
Columbia, S. C.—Granite	.50	1.75	1.75	.....	1.60	.....
Eastern Penn.—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Havelock, Ontario	.....	2.60	2.10	2.10	.....	.....
Lithonia, Ga. (granite)	.75a@1.75	1.60	.....	1.35	1.35	.....
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.—Granite	3.00@3.50	.....	2.00@2.25	2.00@2.25	.....	1.25@2.00
Northern New Jersey (Basalt)	1.50	2.00	1.80	1.40	1.40	.....
Richmond, Calif.—Quartzite	.75*	.....	1.50*	1.50*	1.50*	.....
Somerset, Pa. (sand-rock)	1.85@2.00a	.....	1.35@1.50	.....	1.00@1.50	.....
Toccoa, Ga. (granite)	1.50	.....	.....	1.25	1.25	1.25

*Cubic yd. †1 in. and less. ‡Two grades. ‖Rip rap per ton. (a) Sand. (b) to ⅜ in. (c) 1 in., 1.40. (d) 2 in., 1.30. (e) Dust. (f) ¼ in. (h) less 10c discount. (i) 1 in., 1.40

Agricultural Limestone

(Pulverized)

Alton, Ill.—Analysis 99% $CaCO_3$, 0.3% $MgCO_3$; 90% thru 100 mesh	6.00
Asheville, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Belfast and Rockland, Me. (rail), Lincolnville, Me. (water), analysis $CaCO_3$ 90.04%; $MgCO_3$ 1.5%, 100% thru 14 mesh, bags	4.50
Bulk	3.00
Branchton and Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; pulverized; 50% thru 50 mesh	1.50
Cartersville, Ga.—Analysis 68% $CaCO_3$, 32% $MgCO_3$; pulverized	2.50
50% thru 50 mesh	2.00
Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk	2.50
Chico, Tex.—⅛ in. down	1.50
200 mesh	10.00
Colton, Calif.—Analysis 90% $CaCO_3$, bulk	4.00
Cypress, Ill.—90% thru 100 mesh	1.35
Danbury, Conn., Rockdale and West Stockbridge, Mass.—Analysis, 90% $CaCO_3$, 5% $MgCO_3$; 50% thru 100 mesh; paper bags, 4.75; cloth, 5.25; bulk	3.25
Henderson, N. C. (paving dust)—80% thru 200 mesh, bags	4.25@ 4.75
Bulk	3.00@ 3.50
Analysis $CaCO_3$, 56%; $MgCO_3$, 42%; 65% thru 200 mesh, bags	3.95
Bulk	2.70
Hillsville, Penn.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$; 75% thru 100 mesh; sacked	5.00
Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.00; bulk	2.50
Knoxville, Tenn.—Analysis, 52% $CaCO_3$, 37% $MgCO_3$; 80% thru 100 mesh; bags, 3.95; bulk	2.70
80% thru 200 mesh, bulk	3.50
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.10; bulk	3.60
Marion, Va.—Analysis, 90% $CaCO_3$, pulverized, per ton	2.00
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 90% thru 100 mesh	3.90@ 4.50
Milltown, Ind.—Analysis, 94.50% $CaCO_3$, 33% thru 50 mesh, 40% thru 50 mesh; bulk	1.35@ 1.60
Olive Hill, Ky.—Bulk	2.00
Piqua, Ohio—Total neutralizing power 95.3%; 99% thru 10, 60% thru 50; 50% thru 100	2.50@ 2.75
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.10; bulk	3.60
99% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Rocky Point, Va.—Analysis 99.5% $CaCO_3$, 0.25% $MgCO_3$; 50% thru 200 mesh; bags, 3.25@3.50; bulk	2.00@ 2.25
Waukesha, Wis.—90% thru 100 mesh	4.50
Watertown, N. Y.—Analysis, 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50

Agricultural Limestone

(Crushed)

Alton, Ill.—Analysis 99% $CaCO_3$, 0.3% $MgCO_3$; 50% thru 4 mesh	3.00
Atlas, Ky.—Analysis over 90% $CaCO_3$; 90% thru 4 mesh	1.00@ 2.00
Bedford, Ind.—Analysis, 98.5% $CaCO_3$, 0.5% $MgCO_3$; 90% thru 10 mesh	1.50
Bettendorf, Iowa—97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh	1.50
Blackwater, Mo.—Analysis, 99% $CaCO_3$; 90% thru 4 mesh	.60
(Continued from preceding page)	
Bridgeport and Chico, Texas—Analysis, 94% $CaCO_3$, 2% $MgCO_3$; 100% thru 10 mesh	1.75
50% thru 4 mesh	1.50
Chasco, Ill.—50% thru 100 mesh	1.20
Chico, Texas—90% thru 4 mesh; bulk	1.50

(Continued on next page)

Agricultural Limestone

Chicago, Ill.—50% thru 100 mesh; 90% thru 4 mesh ..... .80
Columbia, Krause, Valmeyer, Ill.—Analysis, 90% $CaCO_3$; 90% thru 4 mesh 1.35
Cypress, Ill.—90% thru 50 mesh, 50% thru 100 mesh, 90% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh 1.35
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh 1.50
Garnet, Okla.—All sizes 1.25
Gary, Ill.—Analysis, approx. 60% $CaCO_3$, 40% $MgCO_3$; 90% thru 4 mesh ..... .75
Kansas City, Mo.—50% thru 100 mesh 1.25
Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh 2.00
Screenings (¼ in. to dust) 1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$, 32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk 1.60
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 50% thru 50 mesh .... 1.85@ 2.35
Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind.—Analysis, 42% $CaCO_3$, 54% $MgCO_3$; meal, 25 to 45% thru 100 mesh 1.60
Milltown, Ind. — Analysis $CaCO_3$, 93.10%, 40% thru 50 mesh ..... 1.35@ 1.60
Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh 1.50
Pixley, Mo.—Analysis, 96% $CaCO_3$; 50% thru 50 mesh 1.25
50% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh 1.65
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk ..... .80@ 1.40
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh ..... .75
Tulsa, Okla.—Analysis $CaCO_3$, 86.15%, 1.25% $MgCO_3$, all sizes 1.25
Waukesha, Wis.—100% thru 10 mesh; bags, 2.85; bulk 2.10

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk 3.00
Piqua, Ohio, sacks, 4.50@5.00 bulk .... 3.00@ 3.50
Rocky Point, Va.—80% thru 200 mesh; bags ..... 4.25@ 4.75
Waukesha, Wis.—90% thru 100 mesh, bulk 3.70

Miscellaneous Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

Glass Sand

Berkeley Springs, W. Va.—Glass sand .. 2.25
Cedarville and S. Vineland, N. J.—
Damp 1.75
Dry 2.25
Cheshire, Mass.:
6.00 to 7.00 per ton; bbl 2.50
Columbus, Ohio ..... 1.25@ 1.50
Estill Springs and Sewanee, Tenn. 1.50
Franklin, Penn. 2.25
Gray Summit and Klondike, Mo. 2.00
Los Angeles, Calif.—Washed 5.00
Mapleton Depot, Penn. ..... 2.00@ 2.25
Massillon, Ohio 3.00
Mineral Ridge and Ohlton, Ohio 2.50
Oceanside, Calif. 3.00
Ottawa, Ill.—Chemical and mesh guaranteed 1.25
Pittsburgh, Penn.—Dry 4.00
Damp 3.00
Red Wing, Minn.:
Bank run 1.50
Ridgway, Penn. ..... 2.00@ 2.25
Rockwood, Mich. ..... 2.75@ 3.25
Round Top, Md. 2.25
San Francisco, Calif. ..... 4.00@ 5.00
St. Louis, Mo. 2.00
Sewanee, Tenn. 1.50
Thayers, Penn. 2.50
Utica, Ill. ..... 1.00@ 1.15
Zanesville, Ohio 2.50
Core and Foundry Sand:
Aetna, Ind.:
Core, Box cars, net, .35; open-top cars ..... .30
Albany, N. Y.:
Molding coarse 2.00
Brass molding 1.75
Sand blast 4.50
Molding fine 2.75

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F.O.B., producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
EASTERN:						
Ambridge & So. H'g'ts, Penn.	1.25	1.25	1.15	.85	.85	.85
Attica and Franklinville, N. Y.	.75	.75	.85	.75	.75	.75
Buffalo, N. Y.	1.10	.95	.....	.....	.85	.....
Erie, Pa.	.....	1.00*	.....	1.50*	1.75*	.....
Farmingdale, N. J.	.58	.48	1.05	1.20	1.10	.....
Hartford, Conn.	.65*	.....	.....	.....	.....	.....
Leeds Junction, Me.	.....	.50	1.75	.....	1.35	1.25
Machias Jct., N. Y.	.....	.75	.75	.....	.75	.75
Montoursville, Pa.	1.00@1.25	1.10@1.25	1.00	.90	.90	.75
Northern New Jersey	.50	.50	1.25	1.25	1.25	.....
Olean, N. Y.	.....	.75	.75	.75	.75	.75
Shining Point, Penn.	.....	.....	1.00	1.00	1.00	1.00
Somerset, Pa.	.....	1.85@2.00	.....	1.35@1.50	.....	.....
South Heights, Penn.	1.25	1.25	.85	.85	.85	.85
Washington, D. C.	.85	.85	1.70	1.50	1.30	1.30
CENTRAL:						
Algonquin and Beloit, Wis.	.50	.40	.60	.60	.60	.60
Attica, Ind.	.75	.75	.75	.75	.75	.75
Barton, Wis.	.....	.50	.....	.75	.....	.75
Boston, Mass.‡	1.60	1.60	2.50	2.50	2.50	2.50
Chicago, Ill.	.70	.50	.50	.60	.60	.60
Columbus, Ohio	.....	.70	.70	.70	.70	.....
Des Moines, Iowa	.40	.40	1.20	1.50	1.50	1.50
Eau Claire, Wis.	.85@1.25	.40@ .50	.80@1.25	.95@1.05	.....	.85@ .95
Elgin, Ill.	.....	.20*	.50*	1.50*	1.50*	1.50*
Elkhart Lake, Wis.	.60	.60	.60	.75	.50	.50
Ferrysburg, Mich.	.....	.50@ .80	.60@1.00	.60@1.00	.....	.50@1.25
Ft. Dodge, Iowa	.85	.85	2.05	2.05	2.05	2.05
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Grand Haven, Mich.	.....	.40@ .80	.....	.60@1.00	.....	.....
Grand Rapids, Mich.	.50	.50	.90	.80	.80	.70
Hamilton, Ohio	.....	1.00	.....	.....	1.00	.....
Hersey, Mich.	.50	.50	.....	.80	.70	.70
Humboldt, Iowa	.....	.85	2.00	2.00	2.00	.....
Indianapolis, Ind.	.60	.60	.....	.90	.75@1.00	.75@1.00
Mason City, Iowa	.45@ .55	.45@ .55	1.35@1.45	1.45@1.55	1.40@1.50	1.35@1.45
Mankato, Minn.	.....	.50	1.35	.60e	1.35	1.35
Mattoon, Ill.	.75	.75	.75	.75	.75	.75
Milwaukee, Wis.	.....	1.01	1.21	1.21	1.21	1.21
Moline, Ill.	.60@ .85	.60@ .85	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Northern New Jersey	.50	.50	1.25	1.25	1.25	.....
Oregon City, Ore.	.....	1.25	1.25	1.25	1.25	1.25
Palestine, Ill.	.75	.75	.75	.75	.75	.75
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
St. Louis, Mo.	1.18	1.45	1.65	1.45	1.65	1.45c
Terre Haute, Ind.	.75	.60	.85	.85	.75	.75
Wolcottville, Ind.	.75	.75	.75	.75	.75	.75
Waukesha, Wis.	.....	.45	.60	.60	.65	.65
Winona, Minn.	.40	.40	1.50	1.25	1.10	1.00
Yorkville, Sheridan, Oregon, Moronts, Ill.	.....	.40@ .70	.30@ .50	.50@ .60	.60	.60
Zanesville, Ohio	.70	.60	.60	.60	.80	.....
SOUTHERN:						
Charleston, W. Va.		All sand, 1.40.		All gravel, 1.50.		
Chattanooga, Tenn.	.....	1.45	.....	.....	1.20	1.20
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.00
Lindsay, Texas	.....	.....	.....	.....	.55	.....
Macon, Ga.	.50	.50	3.50*	3.50*	3.50*	3.50*
New Martinsville, W. Va.	1.00	.80@ .90	1.20@1.30	.....	.....	.80@ .90
Roseland, La.	.50	.50	1.50	1.00	1.00	1.00
WESTERN:						
Baldwin Park, Calif.	.20	.20	.40	.50	.50	.....
Kansas City, Mo.	.80	.70	.....	.....	.....	.....
Los Angeles, Calif. (points all around) (d)	.60	.50	.85	.85	.85	.85
Los Angeles district (bunkers) †	1.50	1.40	1.85	1.85	1.85	1.85
Phoenix, Ariz.	1.25*	1.00*	2.50*	2.00*@2.25*	1.75*	1.50*
Pueblo, Colo.	1.10*	.90*	.....	1.80*	.....	1.60*
San Diego, Calif.	.....	.60	1.25	1.20	1.00	1.00
Seattle, Wash. (bunkers)	1.50*	1.50*	1.50*	1.50*	1.50*	1.50*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.			Dust to 3 in., .40			
Boonville, N. Y.	.60@ .80	.....	.55@ .75	.....	.....	1.00
Chicago, Ill.	.95	.....	.....	.....	.....	.....
Des Moines, Iowa	.50	.....	.....	.....	.....	.....
Dudley, Ky. (crushed silica)	1.10	1.10	.....	.90	.....	.....
East Hartford, Conn.			Sand, .75*			
Elkhart Lake, Wis.	.50	.....	.....	.....	.....	.....
Ferrysburg, Mich.	.....	.....	.....	.....	.....	.65@1.00
Gainesville, Texas	.....	.95	.....	.....	.....	.55
Grand Rapids, Mich.	.50	.50	.....	.60	.....	.....
Hamilton, Ohio	.....	.....	.....	.....	.70	.....
Hersey, Mich.	.....	.....	.....	.50	.....	.....
Indianapolis, Ind.			Mixed gravel for concrete work, at .65			
Lindsay, Texas	1.30	.....	.....	.....	.....	.55
Macon, Ga.	.....	.35	.....	.....	.....	.....
Mankato, Minn.			Pit run sand, .50			
Moline, Ill. (b)	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Ottawa, Oregon, Moronto and Yorkville, Ill.			Ave. .60 per ton all sizes			
St. Louis, Mo.			Mine run gravel, 1.55 per ton			
Shining Point, Penn.			Concrete sand, 1.10 ton			
Smithville, Texas	.50	.50	.50	.50	.50	.50
Summit Grove, Ind.	.50	.50	.50	.50	.50	.50
Waukesha, Wis.	.60	.60	.60	.60	.60	.60
Winona, Minn.	.60	.60	.60	.60	.60	.60
York, Penn.	1.10	1.00	.....	.....	.....	.....

(a) ¾ in. down. (b) River run. (c) 2½ in. and less.
*Cubic yd. †Include freight and bunkerage charges and truck haul. ‡Delivered on job.
(d) Less 10c per ton if paid E.O.M. 10 days. (e) pit run.

Miscellaneous Sands

(Continued from preceding page)

Arenzville, Ill.:		
Core		1.00
Molding fine	1.50@	1.75
Beach City, Ohio:		
Core		1.75
Stone, sawing, coarse		1.75
Molding, fine and coarse, washed	1.75@	2.25
Traction	1.50@	2.00
Furnace lining	2.00@	2.50
Cheshire, Mass.:		
Glass sand, 24 and 40 mesh, bulk		5.00
Columbus, Ohio:		
Core	.20@	.30
Furnace lining		2.50
Molding fine	2.00@	2.50
Molding coarse	1.50@	2.50
Sand blast	3.50@	4.50
Stone sawing	1.50@	2.00
Traction	.30@	.90
Brass molding	2.00@	3.00
Eau Claire, Wis.:		
Sand blast	3.00@	3.25
Core		1.00
Roofing sand		4.25
Elco, Ill.:		
Ground silica per ton in carloads	18.00@	31.00
Elnora, N. Y.:		
Brass molding		1.75
Estill Springs and Sewanee, Tenn.:		
Molding fine and core		1.25
Roofing sand, sand blast, traction	1.35@	1.50
Franklin, Penn.:		
Molding fine and coarse and core		1.75
Gray Summit and Klondike, Mo.:		
Core, roofing and brass molding		2.00
Molding fine and coarse, traction		1.75
Furnace lining		1.00
Stone sawing	.85@	1.00
Joliet, Ill.:		
No. 2 molding sand; also loam for luting purposes and open-hearth work	.65@	.85
Kasota, Minn.:		
Stone sawing		1.00
Mapleton Depot, Penn.:		
Glass sand	2.00@	2.25
Molding fine, coarse, traction and sand blast		2.00
Massillon, Ohio:		
Core, furnace lining and molding fine		2.50
Traction		2.25
Michigan City, Ind.:		
Core and Traction	.15@	.30
Mineral Ridge and Ohlton, Ohio:		
Furnace lining, molding coarse, sand blast, traction (damp)		1.75
Roofing sand (damp)	1.75@	2.00
Core, molding fine (damp)		2.00
Glass sand (dry)		2.50
Montoursville, Penn.:		
Traction	1.10@	1.25
Core	1.25@	1.50
New Lexington, Ohio:		
Molding fine		2.50
Molding coarse		2.25
Oceanside, Calif.:		
Roofing sand		3.50
Ottawa, Ill.:		
Molding coarse (crude silica, not washed or dried)	1.00@	1.25
Red Wing, Minn.:		
Core, furnace lining, stone sawing		1.50
Molding fine and coarse, traction		1.25
Sand blast		3.50
Filter sand		3.75

Crushed Slag

City or shipping point	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in and less	2½ in. and less	3 in. and larger
EASTERN:							
Buffalo, N. Y., Emporium and Dubois, Pa.	2.25	1.25	1.25	1.25	1.25	1.25	1.25
Eastern Penn. and Northern N. J.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Reading, Pa.	2.50	1.00	.....	1.25	.....	.....	.....
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	.....	1.45	1.80@1.85	1.45	.....	1.45	1.45
Jackson, Ohio	.....	1.05	.....	1.30@1.35	1.05	.....	1.30@1.35
Toledo, Ohio	1.50	1.25	1.25	1.25	1.25	1.25	1.25
Youngst'n, O., dist.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.	.....	1.55	.....	1.55	1.55	1.55	1.55
Ensley and Alabama City, Ala.	2.05	.80	1.35	1.25	.90	.90	.80
Longdale, Roanoke, Ruessens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime, Blk.	Lump lime, Bbl.
EASTERN:								
Berkeley, R. I.	.....	.....	12.00	.....	.....	.....	.....	2.20
Buffalo, N. Y.	.....	12.00	12.00	12.00	.....	.....	.....	2.00
Chazy, N. Y.	12.50	9.50	9.00	13.50	11.50	16.50	10.50	2.90
Lime Ridge, Penn.	.....	.....	.....	.....	.....	.....	5.00a	.....
West Stockbridge, Mass.	12.00	10.00	5.60	.....	.....	.....	.....	2.00t
Williamsport, Penn.	.....	.....	10.00	.....	.....	.....	6.00	.....
York, Pa.	.....	9.50	10.50	10.50	.....	.....	8.00	1.65i
CENTRAL:								
Afton, Mich.	.....	.....	.....	.....	.....	.....	8.75	1.65u
Carey, Ohio	12.50	8.50@9.50	9.50	.....	9.50	.....	9.00	.....
Cold Springs, Ohio (f)	12.50	10.00	9.00	.....	9.00	11.00	9.00	.....
Delaware, Ohio	12.50	10.00	9.00	10.00	.....	.....	9.00	1.50
Frederick, Md.	.....	10.00	9.50	10.00	.....	.....	7.50	1.45
Gibsonburg, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	1.50c
Huntington, Ind.	12.50	8.50	8.00	.....	.....	.....	.....	.....
Luckey, Ohio (f)	12.50	.....	.....	.....	.....	.....	.....	.....
Marblehead, Ohio	.....	8.50	8.00	.....	.....	.....	9.00	1.50c
Marion, Ohio	.....	8.50	8.00	.....	.....	.....	.....	.....
Milltown, Ind.	.....	.....	10.00‡	11.00@12.00	.....	.....	8.50‖	1.40w
Sheboygan, Wis.	.....	.....	.....	.....	.....	.....	9.50	.....
Tiffin, Ohio	.....	.....	.....	.....	9.00	.....	.....	.....
White Rock, Ohio	12.50	.....	.....	.....	9.00	11.00	.....	.....
Wisconsin (Brillion, Clifton, Grimms, Green Bay, Hamilliton, Hayton, Knowles, Nasbro, Quarry) (f)	.....	11.50	.....	.....	.....	.....	9.50	.....
Woodville, Ohio	12.50	8.50	8.50	13.50	9.00	11.00₁	8.00	1.50₂
SOUTHERN:								
Allgood and Saginaw, Ala.	12.50	10.00	.....	10.00	.....	1.35u	8.50	1.50
El Paso, Tex.	.....	.....	.....	.....	.....	.....	14.00	1.75
Graystone, Landmark and Wilmay, Ala.	12.50	10.00	.....	.....	.....	.....	8.50	1.50
Keystone, Ala.	12.00	10.00	10.00	10.00	9.00	.....	8.50	1.50u
Knoxville, Tenn.	20.50	10.00	10.00	10.00	.....	.....	8.50	1.50
Ocala, Fla.	13.00	.....	13.00	.....	.....	1.60	12.00	1.70
WESTERN:								
Calcite, Colo.	.....	.....	.....	.....	.....	.....	9.00‖	.....
Kirtland, N. M.	.....	.....	.....	.....	.....	.....	15.00	.....
New Braunfels, Texas	12.00	12.00	10.00	12.00	.....	.....	9.50	1.50
San Francisco, Calif.	21.00	21.00	12.50@15.00	21.00	.....	.....	14.50	1.90v
Tehachapi, Calif.	.....	.....	8.00	.....	.....	.....	13.00z	2.20x
Seattle, Wash.	19.00	19.00	12.00	19.00	19.00	.....	18.60	2.30

†50-lb. paper bags; (a) run of kilns; (c) wooden, steel 1.70; (d) wood; (e) per 180-lb. barrel; (f) dealers' prices; (g) to 9.50; (h) to 1.75; (i) 180-lb. net barrel 1.65; 280-lb. net barrel, 2.65 (m) finishing lime, 3.00 common; (n) common lime; (o) high calcium; (p) to 11.00; (q) to 8.50; (r) to 1.50; (s) in 80-lb. burlap sacks; (t) to 3.00; (u) two 90-lb. bags; (v) oil burnt; wood burnt 2.25@2.50; (x) wood, steel 2.30; (z) to 15.00; (*) quoted f.o.b. New York; (‡) paper bags; (w) to 1.50 in two 90-lb. bags, wood bbl.1.50@1.60; (‖) to 10.00; (₁) 80-lb. paper bags; (₂) 180 lb. net, 187 lb. net, 1.70.

Miscellaneous Sands

(Continued)

Ridgeway, Pa.:		
Molding fine and coarse		1.50
Core		2.00
Round Top, Md.:		
Core		1.60
Glass sand		2.25
Traction		1.75
Sand blast		2.25
Roofing sand		2.25
San Francisco, Calif.:		
Core and sand blast (washed and dried)	3.50@	5.00
Core (pit and drained)	2.50@	4.00
Roofing sand, furnace lining, traction (washed and dried)	3.50@	4.50
Molding fine; pit, 2.50; drained, 2.75; washed and dried		3.50
Molding coarse; pit, 3.75; drained, 4.00; washed and dried		4.75
Brass molding (washed and dried)		3.50
Sewanee, Tenn.:		
Molding fine and coarse, roofing sand, sand blast, stone sawing, traction, brass molding		1.25
Tamalco, Ill.:		
Molding coarse	1.50@	1.75
Tamms, Ill.:		
Ground silica per ton in carloads	20.00@	31.00
Thayers, Penn.:		
Core		2.00
Molding fine and coarse		1.25
Traction		2.25
Utica, Ill.:		
Core, furnace lining and molding, coarse		.80
Molding fine		.75
Utica, Penn.:		
Core		2.00
Molding fine and coarse		1.75
Warwick, Ohio:		
Core, molding fine and coarse (green)		1.75
Core, molding fine (dry)		2.25
Traction (dry)		2.25
Zanesville, Ohio:		
Molding fine	1.75@	2.00
Molding coarse	1.50@	1.75
Brass molding		1.50

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point.

Baltimore, Md.:		
Crude talc (mine run)	3.00@	4.00
Ground talc (20-50 mesh), bags		10.00
Cubes		55.00
Blanks (per lb.)		.08
Pencils and steel worker's crayons, per gross		.08 1.25
Chatsworth, Ga.:		
Crude talc		5.00
Ground talc (150-200 mesh) bags	9.00@	12.00
Pencils and steel worker's crayons, per gross		1.50
Chester, Vt.:		
Ground (150-200 mesh), bulk	8.00@	9.00
Including bags	10.00@	11.00
Chicago and Joliet, Ill.:		
Ground (150-200 mesh), bags		30.00
Dalton, Ga.:		
Crude talc		5.00
Ground talc (150-200) bags		10.00
Pencils and steel workers' crayons, per gross	1.00@	2.50
Emeryville, N. Y.:		
(Double air floated) including bags; 325 mesh		14.75
200 mesh		13.75
Hailesboro, N. Y.:		
Ground white talc (double and triple air floated) including bags, 350 mesh	15.50@	20.00
Henry, Va.:		
Crude (mine run)	3.50@	4.50
Ground talc (150-200 mesh), bags	9.75@	15.00
Joliet, Ill.:		
Ground talc (150-200) bags	12.00@	30.00
Keeler, Calif.:		
Ground (200-300 mesh), bags	20.00@	30.00
Natural Bridge, N. Y.:		
Ground talc (300-325 mesh), bags		13.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

Gordonsburg, Tenn.—B.P.L. 68-72%	4.50@	5.00
Tennessee—F. O. B. mines, gross ton, unground Tenn. brown rock, 72% min. B.P.L.		5.00
Twomey, Tenn.—B.P.L. 65%, 2000 lb.	7.00@	8.00

Ground Rock

(2000 lbs.)

Centerville, Tenn.—B.P.L. 65%		7.00
Gordonsburg, Tenn.—B.P.L. 65-72%	4.00@	5.00
Mt. Pleasant, Tenn.—B.P.L. 65%; bulk		7.25
Twomey, Tenn.—B.P.L. 65%	7.00@	8.00

(Continued on next page)

(Continued from preceding page)

Florida Phosphate

(Raw Land Pebble)

(Per Ton.)

Florida—F. O. B. mines, gross ton, 68/66% B.P.L., Basis 68%	3.00
70% min. B.P.L., Basis 70%	3.55
72% min. B.P.L., Basis 72%	4.10
75/74% B.P.L., Basis 75%	4.85
77/76% B.P.L., Basis 77%	5.60

Fluorspar

Fluorspar, 85% and over calcium fluoride, not over 5% silica, per net ton, f.o.b. Illinois and Kentucky mines	16.00
No. 2 lump, per net ton	19.00
Fluorspar, foreign, 85% calcium fluoride, not over 5% silica, c.i.f. Philadelphia, duty paid, per net ton	16.00
Fluorspar, No. 1 ground bulk, 95 to 98% calcium fluoride, not over 2½% silica, per net ton, f.o.b. Illinois and Kentucky mines	32.50

Special Aggregates

Prices are per ton f.o.b. quarry or nearest shipping point

City or shipping point	Terrazzo	Stucco-chips
Barton, Wis., f.o.b. cars		10.50
Brandon, Vt.—English pink and English cream	*11.00	*11.00
Buckingham, Que.—Buff stucco dash		‡12.00@14.00
Chicago, Ill. — Stucco chips, in sacks f.o.b. quarries		17.50
Crown Point, N. Y.—Mica Spar		8.00@10.00
Easton, Pa., and Phillipsburg, N. J.—Green grits or facings		1.50@ 3.00
Haddam, Conn. — Felstone buff	15.00	15.00
Harrisonburg, Va.—Blk marble (crushed, in bags)	†12.50	†12.50
Ingomar, Ohio		‡8.00
Middlebrook, Mo.—Red		20.00@25.00
Middlebury and Brandon, Vt.—Middlebury white‡	7.00@11.00	7.00@11.00
Milwaukee, Wis.		14.00@34.00
Newark, N. J.—Roofing granules		7.50
New York, N. Y.—Red and yellow Verona		32.00
Red Granite, Wis.		7.50
Sioux Falls, S. D.	7.50	7.50
Stockton, Calif. — "Natrock" roofing grits		10.00@20.00
Tuckahoe, N. Y.		10.00
Villa Grove, Colo.		13.00
Wauwatosa, Wis.		16.00@45.00
Wellsville, Colo.—Colorado Travertine Stone	15.00	15.00

†C.L. Less than C.L., 15.50.
*C.L. including bags; L.C.L. 14.50.
‡C.L. including bags.

Potash Feldspar

Auburn and Brunswick, Me.—Color, white; 98% thru 140 mesh bulk	19.00
Bath, Me.—Color, white; analysis, potash, 12%; 100% thru 180 mesh, bags, 21.00; bulk	18.00
Buckingham, Que.—Color, white; analysis, K_2O, 12-13%; Na_2O, 1.75%; bulk	9.00
De Kalb Jct., N. Y.—Color, white; bulk (crude)	8.00
East Hartford, Conn.—Color, white (60-80 mesh); bags	17.00@20.00
Finer grades	20.00@30.00
Erwin, Tenn.—Color, white; analysis, 12.07% K_2O, 19.34% Al_2O_3; Na_2O, 2.92%; SiO_2, 64.76%; Fe_2O_3, .36%; 98.50% thru 200 mesh, bags, 16.90; bulk	15.50
Los Angeles, Calif.—Color, white; analysis, K_2O, 10.35%; Na_2O, 3.62%; Al_2O_3, 18.71%; SiO_2, 65.48%; Fe_2O_3, .17%; 100% thru 150 mesh, bags, 24.00; bulk	22.00
Murphsboro, Ill.—Color, prime white; analysis K_2O, 12%; Na_2O, 2%; 65% SiO_2; crude, bags, 7.00; bulk	6.50
Pulverized; 98% thru 200 mesh, bags, 22.00; bulk	21.00
99% thru 100 mesh, bags, 21.00; bulk	20.00
100% thru 100 mesh; bags, 20.00; bulk	19.00
Penland, N. C.—Color, white; crude, bulk	8.00
Ground, bulk	16.50
Tenn. Mills—Color, white; analysis K_2O, 18%; Na_2O_3, 10%; 68% SiO_2; 99% thru 200 mesh; bulk	18.00
99% thru 140 mesh, bulk	16.00
Toronto, Can.—Color, flesh; analysis K_2O, 12.75%; Na_2O, 1.96%; crude..	7.75
98% thru 180 mesh, bags, 21.00; bulk	20.00
Trenton, N. J.—Crude, bulk	12.00@27.00
99% thru 140 mesh; bulk	16.00
(Bags 11 cents each, non-returnable)	
Wheeling, W. Va.—Color, white; analysis, K_2O, 9.50%; Al_2O_3, 16.70%; Na_2O, 3.50%; SiO_2, 69.50%; 99% thru 140 mesh, bulk	19.00
Glen Tay, Ontario, Can.—Color, flesh red to pink; analysis, K_2O, 12.81%; Fe_2O_3, .11%, etc., crude, bulk	6.50@ 7.50

Blended Feldspar

(Pulverized)

Tenn. Mills—Bulk	16.00@20.00
Toughkenamon, Pa.—Color, white to light cream; 98% thru 125-150 mesh, bags, 12.00@13.00; bulk	10.00

Chicken Grits

Belfast and Rockland, Me.—(Limestone), bulk, per ton	11.00
Los Angeles Harbor (limestone), 100-lb. sack, 1.00; sacks, per ton, 8.50@9.50†; bulk, per ton	6.00@7.00†
Toughkenamon, Pa.—(Feldspar) 100-lb. bags, 1.00; bulk, per ton	10.00
Danbury, Conn., Rockdale and West Stockbridge, Mass. — (Limestone) bulk	7.50@9.00*
Gypsum, Ohio.—(Gypsum) per ton	15.00
Seattle, Wash.—(Limestone), bulk, per ton	12.50

*L.C.L.
†Less than 5-ton lots.

Sand-Lime Brick

Prices given per 1000 brick f.o.b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis.	10.50
Boston, Mass	14.50
Brighton, N. Y.	*19.75
Dayton, Ohio	12.50@13.50
Detroit, Mich.	*17.50
Farmington, Conn.	18.00
Flint, Mich.	16.00@19.00
Grand Rapids, Mich.	12.00
Hartford, Conn.	18.00
Jackson, Mich.	13.00
Lancaster, N. Y.	13.50
Madison, Wis.	12.00
Michigan City, Ind.	12.00
Milwaukee, Wis.	13.00
New Brighton, Minn.	10.00
Pontiac, Mich.	13.00
Portage, Wis.	15.00
Rochester, N. Y. (del. on job)	19.75
Saginaw, Mich.	13.00
San Antonio, Texas	13.00@13.50
Sebewaing, Mich.	12.00
Syracuse, N. Y.	14.00@15.00
Terra Cotta, D. C.	13.50
Toronto, Canada	12.00
Wilkinson, Fla.-White	12.00
Buff	16.00

*Delivered on job. †Delivered in city limits.
‡Less 5%.

Portland Cement

Prices per bag and per bbl, without bags net in carload lots.

	Per Bag	Per Bbl.
Albuquerque, N. M.		3.47
Atlanta, Ga.		2.35
Baltimore, Md.		2.35
Birmingham, Ala.		2.30
Boston, Mass.		2.63
Buffalo, N. Y.		2.38
Butte, Mont.	.90¼	3.61
Cedar Rapids, Iowa		2.34
Charleston, S. C.		2.35
Cheyenne, Wyo.	.82¾	3.31
Cincinnati, Ohio		2.37
Cleveland, Ohio		2.29
Chicago, Ill.		2.10
Columbus, Ohio		2.34
Dallas, Texas	.48¾	2.15
Davenport, Iowa		2.29
Dayton, Ohio		2.38
Denver, Colo.	.81¼	3.25
Detroit, Mich.		2.05
Duluth, Minn.		2.09
Houston, Texas		2.60
Indianapolis, Ind.		2.29
Jackson, Miss.		2.60
Jacksonville, Fla.		2.50
Jersey City, N. J.		2.33
Kansas City, Mo.		2.33
Los Angeles, Calif.	.63	2.52
Louisville, Ky.		2.27
Memphis, Tenn.		2.60
Milwaukee, Wis.		2.15
Minneapolis, Minn.		2.32
Montreal, Que.		1.90
New Orleans, La.		2.40
New York, N. Y.		2.25
Norfolk, Va.		2.17
Oklahoma City, Okla.		2.56
Omaha, Neb.		2.51
Peoria, Ill.		2.27
Philadelphia, Penn.		2.41
Phoenix, Ariz.		3.70
Pittsburgh, Penn.		2.09
Portland, Colo.	.72½	2.90
Portland, Ore.		2.60
Reno, Nevada	.75¼	3.01
Richmond, Va.		2.47
Salt Lake City, Utah	.70¼	2.81
San Francisco, Calif.		2.31
Savannah, Ga.		2.50
St. Louis, Mo.	.55	2.20
St. Paul, Minn.		2.32
Seattle, Wash.	10c discount	2.65
Tampa, Fla.		2.60
Toledo, Ohio		2.20
Topeka, Kans.		2.40
Tulsa, Okla.		2.43
Wheeling, W. Va.		2.17
Winston-Salem, N. C.		2.79

NOTE—Add 40c per bbl. for bags.

Mill prices f.o.b. in carload lots, without bags, to contractors.

	Per Bag	Per Bbl.
Buffington, Ind.		1.85
Chattanooga, Tenn.		2.45*
Concrete, Wash.		2.35
Davenport, Calif.		2.05
Detroit, Mich.		2.15
Hannibal, Mo.		2.05
Hudson, N. Y.		2.05
Leeds, Ala.		1.95
Mildred, Kans.		2.35
Nazareth, Penn.		1.95
Northampton, Penn.		1.95
Steelton, Minn.		1.90
Toledo, Ohio		2.20
Universal, Penn.		1.85

*Including sacks at 10c each.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	—Plaster Board— ⅜x32x 36". Wt. 1500 lb. Per M Sq. Ft.	½x32x 36". Wt. 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48". Lgths. 6'-10', 1850 lb. Per M Sq. Ft.
Centerville, Iowa	3.00	3.50	15.00	8.00	9.00	9.50	9.50	.....	25.80	10.00	.....	.....	.....
Detroit, Mich.‡	.....	.....	.....	11.30	11.30	11.30	.....	8.00	.....	.....	.....	.....	.....
Delawanna, N. J. (f)	.....	.....	.....	.....	.....	11.50||	.....	8.25s	.....	.....	14.50@15.50	15.50t	40.00
Douglas, Ariz.	.....	.....	7.00	.....	.....	15.50d	18.50	.....	30.00	15.50	.....	.....	.....
Grand Rapids, Mich.	2.75	6.00	6.00	8.00	9.00	9.00	17.50	.....	24.55	20.00	.....	.....	.....
Gypsum, Ohio‡	3.00	4.00	6.00	8.00	9.00	9.00	18.00	7.00	30.00	18.00	.....	20.00	30.00
Hanover, Mont.	.....	.....	.....	11.80	.....	.....	.....	.....	.....	.....	.....	.....	.....
Los Angeles, Calif.	.....	.....	.....	10.30k	.....	.....	.....	.....	.....	.....	.....	.....	.....
Port Clinton, Ohio	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00	.....	20.00	30 00
Portland, Colo	.....	.....	.....	10.00	.....	.....	.....	.....	.....	.....	.....	.....	...
San Francisco, Calif.	.....	.....	12.00	13.40r	14.40r	.....	15.40r	.....	.....	.....	.....	.....	.....
Seattle, Wash.	7.00@8.00	.....	10.00	13.00	.....	.....	.....	.....	.....	.....	.....	.....	.....
Sigurd, Utah	.....	.....	.....	.....	.....	.....	.....	.....	18.00a	.....	.....	.....	.....
Winnipeg, Man.	5.00	5.00	7.00	13.00	.....	.....	.....	.....	.....	.....	20.00	.....	33.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable).
*To 3.00; †to 11.00; ‖to 12.00; ‡prices per net ton, sacks extra; (a) to 21.00; (b) net; (c) gross.
(d) hair fibre; (f) delivered; (h) delivered in 6 states; (i) delivered on job; (k) sacks 12c extra, rebated.
(m) includes paper bags; (o) includes jute sacks; (r) including sacks at 15c; (s) to 9.40; (t) to 16.50.

Traffic and Transportation

By EDWIN BROOKER, Consulting Transportation and Traffic Expert
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning January 9:

Central Freight Association Docket

12132. Agricultural limestone. Branchton, Harrisville, Hilliards, Osbornes and Wick, Penn., to Margaret Mine, Nu Mine and Yatesboro, Penn. Present rates, no through commodity rates in effect; proposed, 9½ cents.

12136. Stone, viz.: Block, bridge, curbing and dressed. Lansing, Mich., to various points in Michigan.

To (Michigan)	Proposed rates in cents
Allegan	202
Alma	176
Bay City	202
Cadillac	265
East Jordan	365
Flint	164
Hastings	164
Kalamazoo	176
Owosso	139
Petoskey	265
Reed City	227
Rogers City	365
Saginaw	176
Traverse City	365

12128. Crushed stone. Foraker, Ohio, to Ohio. Present and proposed rates:

	Local rates in cents	
Stations (Ohio)	Proposed rates	Present rates
Wren and Glenmore	90	90
Ohio City, Elgin, Spencerville and Kemp	70	70
Lima	60	80
Westminster and Harrods	60	70
Alger and McGuffey	60	60
Hepburn	60	70
DeCliff and Espyville	60	90
Marion, Green Camp, Codding, Woodland, Richwood, Claiborne, Broadway and Peoria	70	90
Pottersburg, North Lewisburg, Mingo, Kennard, Kings Creek, Urbana, Bowlusville, Maitland, and Sugar Grove Hill	80	90
Slicks	70	230
Caledonia	70	240
Martel and Galion	70	260
Ontario and Mansfield	70	270
Summit and Pavonia	80	280
Milton	80	290
Ashland, Nankin, Polk and West Salem	80	300
Burbank	90	320
Creston, Sterling and Rittman	90	330
Wadsworth, Silver Creek, Barberton and Akron	90	340
Kent	100	360
Ravenna	100	370
Braceville	110	370
Cleveland	90	340
Garrettsville	110	390
Lisbon	160	400
Warren, Youngstown, North Warren, Burghill and Cortland	150	400

PROPOSED JOINT RATE

Brookfield	$1.60
Delaware	.80
East Liverpool	1.60
Fostoria	.90
Harpster	.80
Kinsman	1.70
Meredith	.80
Morral	.80
Owens	.80
Prospect	.80
Quincy	.80
Rouseulps	.80
Springfield	.80
Upper Sandusky	.80

12149. Sand. Port Washington, Ohio, to Canton, Ohio. Present rate, 12 cents; proposed, $1.00 per net ton.

12178. Crushed stone. Carloads, Huntington, Ind. (via Wabash Railway, Peru and C. & O. Railway), to North Judson and Richmond, Ind. Present rates, $1.10 to North Judson and $1.27 to Richmond; proposed, $1.05 to North Judson and $1.15 per net ton to Richmond, Ind.

12179. Sand, except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam molding or silica. Midway, Ohio, to Monroe, Mich., via Wabash Railway, Toledo Ohio, N. Y. C. Railroad. Present rate, $2.70 per net ton; proposed, 90 cents per net ton.

12180. Crushed stone. Carloads, Milltown, Ind., to Poseyville, Ind. Present rate, $1.19 per net ton; proposed, $1.13 per net ton.

12194. Sand, blast, engine, foundry, glass, loam, molding or silica. Carloads, Phalanx, Ohio, to various points in Michigan listed below: List of destinations: Adrian, Britton, Carleton, Detroit, Dundee, Ecorse, Milan, Monroe, Romulus, Tecumseh, Trenton, Wyandotte. Present rate, $2.27 per ton of 2000 lb.; proposed, $1.89 per ton of 2000 lb.

12195. Crushed stone. Carloads, Monon, Ind., to various points in Indiana:

	From Monon, Ind.	
To	Present rate	Proposed rate
	Rates in cents per net ton	
Burnettsville	95	70
Idaville	95	70
Seafield	90	76
Wolcott	90	76
Wheeler	95	90
Valparaiso	95	85
Kouts	95	80
Aylesworth	95	85
Hebron	95	85

Trunk Line Association Docket

12915. To cancel the following rates on sand and gravel, carloads, now carried in N. Y. O. & W. Tariff, I.C.C. 9712, as follows:

Sand and gravel, common. N. O. I. B., from Bernhards, N. Y., Cleveland, N. Y., Fish Creek, N. Y., Rome, N. Y., and Sylvan Beach, N. Y., to Hamilton, Ont., rate in I.C.C. 9712 (present), $3.05 per 2000 lb.; rate in Agent Wilson's A111 (present), $3.20 per 2000 lb. To Toronto, Ont., rate in I.C.C. 9712 (present), $3.45 per 2000 lb.; rate in Agent Wilson's A111 (present), $3.20 per 2000 lb.

Sand, glass. From Cleveland and Rish Creek, N. J., to Thorold, Ont., rate in I.C.C. 9712 (present), $2.40 per 2000 lb.; rate in Agent Wilson's A111 (present), $2.90 per 2000 lb.

Future rates will be as per Agent Wilson's Tariff I.C.C. A111 as are shown above under heading rate in Agent Wilson's A111.

Reason for this proposal: The above creates advances and reductions but will place rates on their proper basis. It has been found at this time that no traffic has moved on the above rates.

12916. Slate, crushed, dust or ground. Carloads, from Fair Haven, Vt., to Castleton, Vt., inclusive, and Poultney, Vt., to West Pawlet, Vt., inclusive, to Henry and Bedford, Va., $4.85 per net ton of 2000 lb.

12917. Fluxing stone and fluxing limestone. Carloads, from Annville, Hummelstown, Lebanon, Myerstown, Palmyra and Swatara, Penn., to Pencoyd and Philadelphia, Penn., $1.80 per 2240 lb. Reason for this proposal: To place the rates more in line with others in that territory.

Southwestern Freight Bureau Docket

6834. Stone. From points in Minnesota to points in Texas. To establish a rate of 52 cents per 100 lb. to Houston, Texas, 48½ cents per 100 lb. to Forth Worth, Texas, 53 cents per 100 lb. to Breckenridge, Texas, and 48 cents per 100 lb. to Dallas, Texas, on building stone, rough or dressed, not carved, lettered, polished, or traced, carloads, minimum weight for shipments loaded in 40,000 lb. capacity cars will be 38,000 lb., from Rockville, St. Cloud, and Cold Springs, Minn. There are no through rates published on this traffic at the present time and shippers request the publication of the Kansas City-Texarkana combination with the use of Agent Jones' Combination Tariff No. 228.

6837. Asphalt rock. From Iantha, Mo., to Pittsburgh, Kan. To establish a rate of 3½ cents per 100 lb. on asphalt rock, carloads, minimum weight 90% of marked capacity of car, except when weight of shipment loaded to full visible capacity of car is less than 90% of marked capacity of car the actual weight will apply, but in no case shall the minimum weight be less than 40,000 lb. from Iantha, Mo., to Pittsburgh, Kan. There is a plant being built at Iantha, Mo., which requests the publication of the rates that will enable them to move the traffic.

6878. Stone. From Rockville, Minn., to Fort Worth, Texas. To establish a rate of 81½ cents per 100 lb. on stone, building, carved, lettered, polished or traced, carloads, minimum weight 40,200 lb., from Rockville, Minn., to Fort Worth, Texas. The present rate, it is stated, is applicable via certain routes and it is desired to enable all lines to participate on an equal basis.

6879. Limestone. From points in Texas to points in Louisiana. To establish a joint line mileage scale of rates now published from Harrys, Texas, in item 6978B of S.W.L. Tariff No. 8F on limestone, ground, carloads, minimum weight 50,000 lb., for application from Morris Spur and Lone Star Spur, Texas, to points in Louisiana on the T. & P. Railway, and St. Louis Southwestern Railway. Shippers operating plants at Lone Star Spur and Morris Spur, Texas, desire to market ground limestone at points in Louisiana to be used as fertilizer but present class rates are prohibitive. They request the same scale of rates as applies from Harrys, Texas.

New England Freight Association Docket

9414. Lime and limestone. Minimum weight 50,000 lb., from Cheshire, Farnams, North Adams, Renfrew, Richmond, and Zylonite, Mass., to Greensand, N. J., lime, 17 cents; limestone, 16 cents. Reason: To establish a rate the same as published to other nearby New Jersey stations.

Southern Freight Association Docket

24487. Rock, bituminous asphalt. Carloads, as described in I. C. Railroad Tariff I.C.C. 6910 from Big Clifty, Rockport, and Summit, Ky., to Tennessee points named below. No through rates in effect, and it is proposed to establish the following commodity rates, which are in line, distance considered, with rates in effect to other points in the same general territory: To Columbia, Lynnville, Buford, Reynolds and Riversburg, Tenn., $2.93; to Wales and Pulaski, Tenn., $3.16 per net ton.

24515. Marble, rough. Carloads, minimum weight 40,000 lb., from Brownson, Ala., to Buffalo, N. Y. Present rate, 49 cents per 100 lb. (combination); proposed, 36 cents per 100 lb., same as in effect to Rochester, N. Y., and also same as in effect from Gantt's Quarry, Ala., to Buffalo, N. Y.

24531. Sand and gravel. It is proposed to revise present rates on sand and gravel, carloads, minimum weight 90% of marked capacity of car except when cars are loaded to their visible capacity actual weight will govern, from Coosada, Oktamulko, Prattville Junction, Jackson's Lake and Montgomery, Ala., to Elmore, Ala., which are the same as produced by the Georgia-Alabama scale, less 10%. Present and proposed rates are as follows:

	In cents per net ton		
	Present		
From	Sand and gravel		Proposed
Coosada, Ala.	48	100	45
Oktamulko, Ala.	48	100	45
Prattville Jct., Ala.	48	120	45
Jackson's Lake, Ala.	48	120	50
Montgomery, Ala.	57	80	54

24541. Sand and gravel. Carloads, minimum weight 90% of marked capacity of car, except that when cars are loaded to their visible capacity actual weight will govern, from Carrollton, Ky., to Lexington, Jett, and Midway, Ky. Present rate, $1.35; proposed, $1.20 per net ton, which is the same as in effect to stations on the L. & N. Railroad, Frankfort, Ky., and north thereof.

24542. Stone, crushed. Carloads, minimum weight to Newport, Ky., or Winchester, Ky., 60,000 lb., beyond Newport or Winchester, 40,000 lb., from Whitestone, Ga., to South Charleston, W. Va. The present rate is Newport, Ky., combination of $4.00 per net ton, and it is proposed to establish this combination as a through rate to apply via Newport or Winchester.

24565. Limestone. It is proposed to establish joint through rates on ground or pulverized limestone, carloads, minimum weight 30 net tons, from Ashford (formerly Linville Falls), N. C., to Southern Railway stations in North Carolina west of Ashville and to Southern Railway Murphy Branch stations, on basis of joint mileage scale as published in Southern Railway I.C.C. A-9956.

24576. Marble, granite and stone. Carloads, from Rowell, Ga. (C. of Ga. Railway), to points named below. Class or combination rates now apply and it is proposed to establish rates on the following basis: To Ohio river crossings, proper and when for beyond, same as from Tate, Ga., to Cincinnati and Louisville; to Memphis, Tenn., Nashville, Tenn., St. Louis, Mo., Gulf ports,

Mississippi river crossings between Memphis and New Orleans, Virginian cities, Baltimore, Md., and Philadelphia, Penn., New York, N. Y., and Boston, Mass. (via all rail), same as from Tate, Ga. (rail and water rates to Eastern cities named, to be 3 cents lower than rates via all rail): To Brunswick, Ga., same as from Tate, Ga., to Jacksonville, Fla.; to Jacksonville, Fla., and Charleston, S. C., same as from Tate, Ga.

24584. Sand. Carloads, minimum weight 90% of marked capacity of car except when cars are loaded to their visible capacity, actual weight will govern, from Decatur, Ala., to Columbia, Peerce, Glendale and Pleasant Grove, Tenn. Present rate, 6 cents per 100 lb. ($1.20 per net ton); proposed, $1.00 per net ton, made with relation to present rate from Estill Springs, Tenn., to Columbia, Tenn.

24595. Stone, crushed. Carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to their capacity, actual weight shall govern, from Rocky Point, Indian Rock and Eagle Mountain, Va., to Ruggles, Delmar, Enfield, Whitaker, Battleboro, Armstrong and Rocky Mount, N. C. Lowest combination now applies. Proposed, $2.00 per net ton, same as rate in effect from Klotz, Va.

24598. Stone, viz.: Crushed. Carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to their visible capacity actual weight will govern, from Jacksonville and Florida Transfer, Fla. (when from beyond), to Palmetto, Fla. Present rate, $1.90; proposed, $1.65 per net ton, same as at present in effect to Bradentown, Fla.

24608. Bituminous rock, crushed or ground, usual description. Carloads, from Bowling Green and Epleys, Ky., to Brookhaven, Natchez and Roxie, Miss. Present rates: From Bowling Green, 22½ cents per 100 lb.; from Epleys, combination rate applies. Proposed: To Brookhaven, $3.99; Natchez and Roxie, $4.09 per net ton; made with relation to current rates from Rockport, Summit and Big Clifty, Ky.

24618. Ground limestone. It is proposed to cancel the present commodity rates on agricultural stone (ground limestone), carloads, and on limestone, ground or pulverized, carloads, from Mt. Pleasant, Tenn., to destinations shown in L. & N. Railroad, I.C.C. A-15302, L. & N. Railroad, I.C.C. A-15212 and any other tariffs where rates are published on these commodities from Mt. Pleasant, Tenn., account of no movement. Class or combination rates to apply after cancellation.

24625. Lime. Carloads, minimum weight 30,000 lb., from Erin, Tenn., to destinations shown in Agent Glenn's Lime Tariff I.C.C. A-380, to which rates are published from Palmyra, Tenn., except to points where specific rates are in effect from Erin, Tenn. To the L. & N. Railroad stations involved, Class N rates now apply; to destinations on other lines combination rates are at present in effect. Proposed: Same as in effect from Palmyra, Tenn.

24635. Marble, polished or dressed. Less than carloads, from Marietta, Canton, Ball Grounds, Nelson and Tate, Ga., to Indiana, Michigan, Ohio and Wisconsin points. At present lowest combination applies. Proposed: From Marietta, same as from Elberton, Ga., and Atlanta, Ga.; from other origins named, 6 cents per 100 lb. higher than proposed from Marietta.

Transcontinental Freight Bureau Docket

6415. Stone, finished. Carloads, E. B.; request for rate of 92½ cents per 100 lb. on stone, finished, from Laws, Calif., to Chicago, Ill., under Tariff 3S (I.C.C. 1154, R. H. Countiss, agent).

6445. Crushed gravel. Carloads, W. B. Request for rate of 50 cents per 100 lb., minimum weight 80,000 lb., on crushed gravel from Jedburg, Mo., to Pacific Coast points under Tariffs 1-Y (I.C.C. Nos. 51, A-154, 1688 and 1155 of Frank Van Ummerson, H. Wilson, B. T. Jones and R. H. Countiss, agents, respectively).

Lime Complaint Dismissed

IN a mimeographed report by division 3, the Interstate Commerce Commission has dismissed the complaint in No. 15893, Louisville Cement Co. vs. Southern et al., on a finding that rates on lime, in carloads, from Milltown, Ind., to destinations in central territory, are not unreasonable or unduly prejudicial. The rates were assailed on the ground that they were unreasonable and unduly prejudicial as compared with the contemporaneous rates on lime from Mitchell, Bedford and Salem, Ind., to the same destinations. The commission was asked to prescribe rates from Milltown not in excess of those from the other Indiana points named. The report said that complainant's evidence was directed to establishing that Milltown, from its location, both geographically and geologically, was entitled to be grouped with the three other Indiana points and should take the same rates on lime to destinations in central territory. Continuing, the commission said:

Certain of the defendants assert that the Monon is responsible for Salem and Bedford taking the same rates at Mitchell; and that in according to Salem the same rates as Mitchell the scale prescribed in Lehigh Lime Co. vs. A. C. & Y. Ry. Co., 85 I. C. C. 341, has been disregarded. They contend that the complainant's failure to name the Monon as a defendant prevents us from issuing an order if undue prejudice be found in the existing rates. The Monon was not served with a copy of the complaint as required by the act, and it was not represented at the hearing. The trial examiner therefore erred in allowing complainant's motion to add the Monon as a party defendant. Complainant's counsel urges that as the delivering lines are before us the failure to name the Monon as a defendant is immaterial, citing Lake Dock Coal Cases, 89 I. C. C. 170, 185.

After setting forth a table containing rate comparisons relied upon by the complainant to show undue prejudice, the commission said:

The rates from Mitchell are based on the scale prescribed in the Lehigh Lime Co. case, supra. To accord the same rates to Bedford as apply from Mitchell certainly is not unduly preferential of Bedford for, as shown by the foregoing comparisons, that point is nearer the destination points than Mitchell; nor can we conclude from these comparisons that Milltown has been unduly prejudiced in having to pay rates from .5 to 2.5 cents over Mitchell and Bedford for additional distances from 20.7 miles to 63.3 miles. Indeed, in certain instances the rates favor Milltown. This is particularly in respect to the rates to Indianapolis, South Bend, Logansport, Peoria and East St. Louis. It is only when we consider the rates from Salem that a suggestion of undue prejudice appears. But we do not feel justified in making a finding to that effect, for there is no showing by complainant that the delivering carriers named defendants herein which participate in joint rates from Salem that are lower than the rates from Milltown for comparatively equal distances can by withdrawing from such participation thereby remove the alleged undue prejudice against Milltown. In this essential respect the present case differs from the Lake Dock Coal Cases, supra. Moreover, in certain instances the delivering lines shown in complainant's comparisons are not the same; for example, the Chicago & Eastern Illinois is shown as the delivering carrier on shipments, from Milltown and the Monon, not named as a defendant, on shipments from Salem and Bedford.

Salem is a local point on the Monon. From the testimony and the briefs of the defendants we infer that the movement from that point is not in the same volume as from Mitchell and Bedford; and that it was due to the action of the Monon that Salem was given the same rates as Mitchell. They suggest that any preference now enjoyed by Salem can be removed through the establishment from that point of rates based on the scale prescribed in the Lehigh Lime Co. case, supra, and that Milltown could be accorded rates similarly constructed. Complainant objects to such an adjustment, and urges that because certain Eastern and Southern lime-producing points are grouped southern Indiana points should likewise be grouped. Group rates are largely the result of voluntary action on the part of the carriers serving the group points in disregarding, for competitive reasons, the element of distance. We cannot compel them to disregard distance unless in their rate adjustments they commit some violation of the act.

The evidence does not sustain the allegation of unresonableness.

We find that the rates assailed are not unreasonable or unduly prejudicial. The complaint will be dismissed.

Commissioner Campbell concurring, said:

I go with the finding under section 1, but I think the assailed rates to all destinations to which the delivering line-haul carriers are properly before us as defendants are unduly prejudicial to the extent that they exceed the contemporaneous rates from Salem.—*Traffic World.*

Nebraska Commission Denies Increase on Sand-Gravel Rates

THE Rock Island Railroad Co. was denied the right to raise its rates on sand and gravel from Fairbury to Lincoln from 3 cents to 4 cents, but the commission says that if it will ask for 3½ cents it will be granted. The Nebraska Rail Commission says that the railroads have the wrong idea that when it created a 3-cent rate for all pits within 50 miles of Lincoln and Omaha it meant to pick out certain pits to be benefited. In fact it merely wished to create a zone upon which distance rates could be based.

The Rock Island formerly charged 4 cents for hauls from Fairbury to Lincoln, a distance of 57 miles, but not getting its share of business from the zone pits cut the Fairbury-Lincoln rate. The pit owners in the zone then filed a complaint that would have upset the whole schedule and given them a still lower rate, and rather than have this happen the Rock Island applied for the 4-cent rate again.—*Sioux City (Iowa) Tribune.*

Southern California Rock Rates Held Reasonable

THE complaint of the Union Rock Co., Los Angeles, Calif., charging that the rates charged by the Santa Fe, Southern Pacific, and Pacific Electric railways in southern California are unjustly high and discriminatory was dismissed by an order of the California State Railroad Commission recently.

The decision was handed down following two recent lengthy hearings in which representatives of the railroads held that the complaint was not valid because the rates have been established as a standard on haulage charges for sand and gravel.—*Los Angeles (Calif.) Times.*

New Machinery and Equipment

New Gas-Air Shovel

A POWER shovel with features so novel that they may work a revolution in machines requiring intermittent power has just been placed on the market by the Erie Steam Shovel Co., of Erie, Penn. It was developed, according to the makers, by three years of research and experiment. It will be shown at the coming road show.

New shovel using gasoline and heated air engines

The new shovel has a single gasoline engine, a 4-cylinder Waukesha with Ricardo head. The cylinders are 5¾-in. in diameter and the piston stroke is 8-in. This drives the hoist directly. At such times as the engine is not hoisting it drives an air compressor which stores air in a cylinder until a predetermined pressure is reached when the compressor cuts out.

This air is used to drive the crowding and thrusting engines of the shovel. These are like steam engines and are direct connected to the motions thus obviating reversing friction clutches. The engines have the "characteristics" of steam engines which is an advantage in shovel work.

Before passing to these engines the compressed air is heated to about 400 deg. F. The heat comes from the exhaust of the gasoline engine and thus a source of power ordinarily sent to waste is utilized. The heating of the air, according to the makers of the shovel, increases the volume about 75%. Because the air is heated a smaller part of the gas engine's power is needed to compress the air that runs the swinging and crowding engines. The makers estimate that the saving of power by this arrangement is really important. In ordinary shovels they estimate that 40% of the total power generated is used for crowding and swinging, and that this is reduced to 25% on the new shovel, due to the storing and heating of the air. The full 100% of the power generated is always available for hoisting.

According to the makers' figures, the operation of this shovel has resulted in remarkable fuel economy, the average for 100 cu. yd. dug being between five and six gallons of gasoline. This is because the engine runs at normal speed and load the greater part of the time, which is the condition for the greatest fuel economy.

It is claimed that harder material can be dug by using the full power of the gasoline engine, direct connected to the hoist, helped by the full power of the air engines when needed. The three engines pulling together are reported to have given some remarkable results in the digging of hard shales. The operation is simple and the method is quickly learned by a steam shovel operator.

The makers point out that the machine is very strongly constructed and note that the gasoline engine shaft is 3¾-in. in diameter and the compressor shaft is 4-in. and that this standard has been carried all the way through.

Waste Meter Measures Heat Loss and Carbon Dioxide Content of Stack Gas

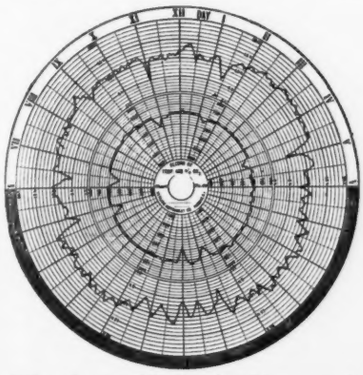
THE "waste meter," a recording device recently introduced by the Uehling Instrument Co. of Paterson, N. J., is appropriately named, for it registers losses of heat in the stack as well as indicating the CO_2 content of the stack gasses, the combination of the two being a measure of the completeness of the combustion.

%CO2	Temperature of Chimney Gases					
	350° F		500° F		650° F	
	B. t. u. Wasted	% Wasted	B. t. u. Wasted	% Wasted	B. t. u. Wasted	% Wasted
14%	1321	9.1	2010	13.9	2692	17.9
10%	1830	12.7	2775	19.2	3718	25.7
6%	2999	20.6	4540	31.3	6100	42.0

Table of heat losses

This instrument records carbon dioxide content and heat of stack gases

Neither the CO_2 content or the stack gas temperature of itself serves as a basis for calculating actual heat losses. A partial table from the literature of the Uehling company, showing how the combined records are figured into actual B.t.u. losses, is given here.



The chart with the double record

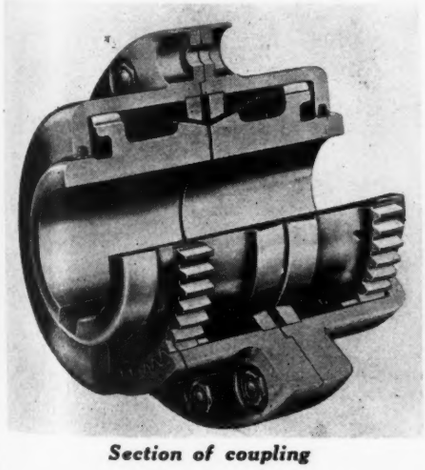
The records of both temperature and CO_2 content are continuous. Some of the things that are shown by the CO_2 record of itself are: How much excess air was used in burning the fuel, when fuel was fired, when fires were cleaned or banked and when damper adjustments were changed. It also shows any infiltration of air through the setting.

The temperature record of itself shows: When the firing was forced, when soot was blown, when scale was removed and the up-passing of the gas due to leaky or broken down baffles in the furnace used with certain types of boilers.

New Flexible Coupling

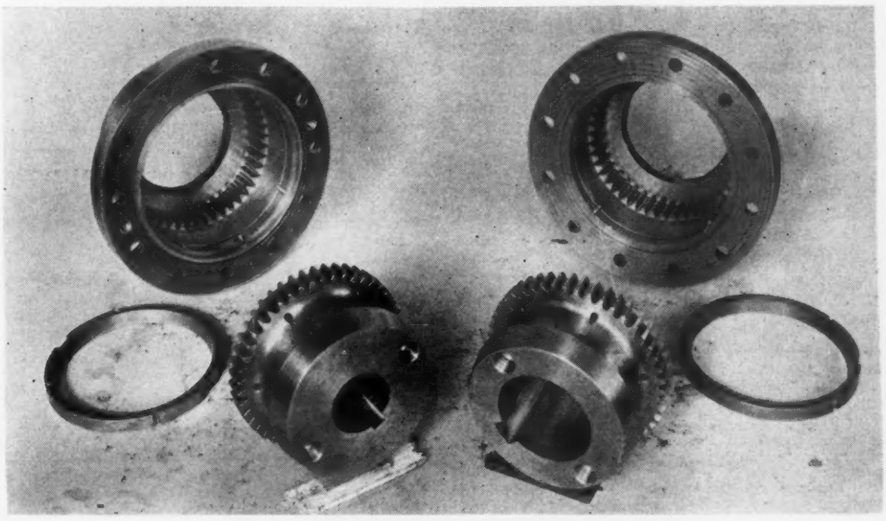
THE Poole Engineering and Machine Co. of Baltimore, Md., has recently brought out a new flexible coupling. Its purpose is to compensate for errors of shaft misalignment, which are often unavoidable. The new coupling is of the all metal type and the makers say that it will operate equally well in either direction on continuous or reversing service or at high or low speeds.

The two pictures show the construction of the coupling. There are no springs or bush-bearing on the surface of each shaft hub."



Section of coupling

ings in the assembly. There are only two external-internal gears and two aligning rings. The outer faces of the gear teeth on the hubs are formed spherically and the makers say that "this provides a true self-aligning bearing for the connecting sleeves, so that if the two shafts are out of alignment the sleeves assumes a neutral position with a perfectly formed and lubricated



All the parts of the new flexible coupling

There is an oil space in the coupling which is filled with oil, and when the shaft is in motion the oil spreads under centrifugal pressure so that the sleeve bearings and the gear teeth are entirely submerged in oil.

All parts are made of high carbon forged steel and accurately machined so as to be interchangeable.

New Ball Bearing Sheave

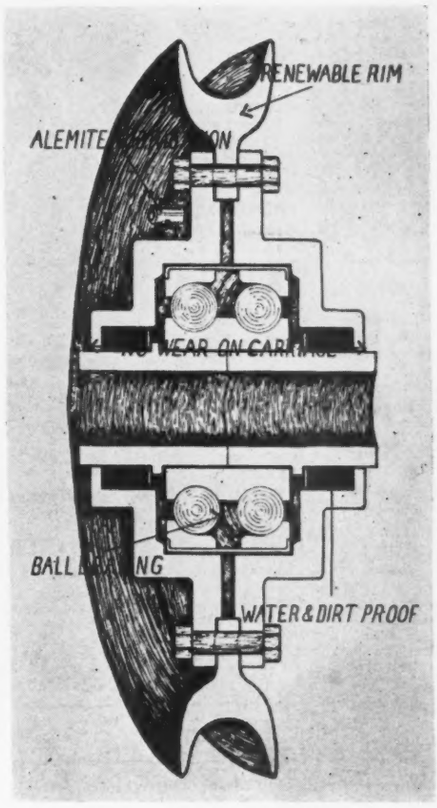
A NEW ball bearing sheave for wire rope work has recently been introduced by the Hart Sheave Co. of Martinsville, Ind., which will have a considerable application in the rock products industries. The form illustrated here in that which is used with cableway dragline installations.

The rim of the sheave, which takes all the wear, is replaceable at small cost, so that the hub and bearing will wear a long time. The bearing is said to be a really dust tight and water tight bearing so that there is no danger of grit entering or of oil or grease escaping. The Alemite lubrication system may be employed which insures adequate lubrication as well as the saving of time and oil.

Investigation of the Efficiency and Durability of Spur Gears

THE University of Illinois has recently put out bulletin No. 149, on the results of the work done on the efficiency and durability of spur gears by C. W. Ham, associate professor of machine design and G. W. Huckert, both members of the technical staff of the engineering experiment station.

Investigations were carried out on a machine especially designed for the purpose by Wilfred Lewis, president of the Tabor Mfg. Co. Study was made on the results of tooth friction, and the efficiency curves from test runs plotted. The effects of tooth proportion, transmitted load, lubrication, speed and irregular spacing of teeth were investigated and efficiency curves plotted from the results obtained. Considerable effort was made to determine the causes of tooth failure due to excessive wear, uneven loads, and change of tooth outline due to improper lubrication which results in decreased durability of the gears.



Section of new ball-bearing sheave

News of All the Industry

Incorporations

Union Gravel Co., Monroe, La., $50,000.

Verona Quarries, Ltd., Hamilton, Ont. $100,000.

Pueblo Lime Co., Pueblo, Colo., increased stock from $25,000 to $50,000.

Mt. Gilboa Gravel Co., Fowler, Ind.; to mine and sell sand and gravel.

J. T. Tetreault, Montreal, has been registered. To engage in quarry operations.

Santa Rosa Cement Co., Wilmington, Del., $8,500,000 (Corp. Trust Co. of America).

Hollywood Duntile Co., Hollywood, Fla., $20,000; F. O. Reed, C. R. Chisholm and others.

Builders and Foundry Sand Co., Bedford, Ohio, $500; E. H. Donohue, P. J. Gueley and others.

Clear Creek Gravel Co., Denver, Colo., $50,000; N. C. Bishop, H. C. Keiser, D. A. Roller and others.

H. E. Baker, Inc., 1373 Sheridan avenue, Plymouth, Mich., $10,000. To engage in the manufacture and sale of concrete products.

Cement Contractors Co., Cleveland, Ohio, $10,000; V. J. Wainwright, E. A. Kordick, I. C. Vinneran, J. H. Davis and Gus Rosen.

Fuller Gravel, Belleville, Ont.; 2500 preference shares, par value $100 each or $250,000 and 1000 common shares of no par value. To carry on the business of stone crushing and to deal in sand, gravel, crushed stone and dimension stone.

Quarries

Brandon Rock Products Corp., Middlebury, Vt., have moved their general offices to 25 Elm place, Middlebury, Vt.

Little River Limestone Co., Radford, Va., has resumed work at their quarry because of the demand for crushed stone. Original plans had called for the closing of the quarry for the winter months.

Alonzo Roth, a driller at the quarry of the St. Genevieve Lime and Stone Co., Perryville, Mo., was slightly injured by the explosion of a delayed hold which did not go off until after he had returned to the pit.

Eberhard's Limestone Quarries have resumed operations after a long period of idleness. This is to supply limestone for the Reading company's furnace at Catasauqua, Penn., which has now gone to blast.

Sand and Gravel

W. H. Brode Co., Cohocton, Ohio, will soon start work on the erection of a gravel plant at Browning's Ford.

Osgood Construction Co., Nashua, N. H., have opened a new pit at Hudson. For the past few months they have been drawing from their pit at Fairmount Heights.

Ruud Construction Co., Butler, Penn., has obtained permission from the federal government to dredge sand and gravel from the bed of the Allegheny river between Warner and Tionesta, Penn.

Fort Worth Sand and Gravel Co., Fort Worth, Texas, has let the contract for the design, machinery and equipment for a new gravel washing and screening plant to the Smith Engineering Co., Milwaukee, Wis.

South River Sand Co., New Brunswick, N. J., has filed a protest against the proposed closing of the South river draw for 30 days. It is alleged that material losses will result if the company's product has to be shipped by truck instead of the water route, due to an increase in freight rates.

Cement

Dewey Portland Cement Co., Dewey, Okla., distributed over $22,000 to 247 employes as a bonus for the past year. Amounts paid to individuals were based on length of service and average salary during that period.

Cement Products

Southern Cement Products Co., Riverside drive, Knoxville, Tenn., is about to begin erection of a factory building at the corner of Sutherland avenue and Concord street.

Leo L. Bronk Culvert Co., Winona, Minn., have just finished their new factory, 28x56 ft. of cement block construction. Additional equipment such as a block-making machine, mixer, etc., will be soon installed. It is planned to heat the factory and thus allow the manufacture of cement products to continue throughout the winter.

Talc

Georgia Talc Co., Chatsworth, Ga., have recently overhauled their plant and installed considerable new machinery so as to take care of future increased business. Present capacity of the plant is 60 tons per day and 150 to 200 gross talc crayons per 10-hr. day.

Limestone

Hughes Stone Co., Tulsa, Okla., has donated a carload of limestone to the farmers of Lenapah district, Nowata, Okla. The stone was transported free by the Missouri Pacific railroad.

Kelley Island Lime and Transport Co., Cleveland, Ohio, offer of a carload of limestone to farmers of Washington township, W. Va., on condition of them agreeing to conduct past improvement demonstrations has been accepted by them and the demonstrations set for next summer at Alledonia, W. Va.

Magnesite

Northwest Magnesite Co., Chewelah, Wash., has started another kiln at their plant and put on about 25 more men.

Ritestone Products Co., Westchester avenue and Bronx River, New York, manufacturer of waterproof magnesite stucco products, is reported to be planning the establishment of a new mill at Jacksonville, Fla. A temporary plant will be arranged, using one of the buildings of the Union Terminal Co., recently leased. D. W. Pye is president; E. L. Cline is secretary.

Miscellaneous Rock Products

Ochre Producers, Inc., Allentown, Penn., is arranging to purchase equipment for its plant at Hancock, Penn., including conveyors and elevators, grinders, pulverizers, steam shovel, trucks, car unloaders, boiler apparatus and accessories.

Personal

Martin Myers, president of the International Cement Co. of Argentina, arrived recently at New York on the Munson liner American Legion.

E. J. Heimerdinger, plant superintendent and purchasing agent of the Louisville Cement Co., was elected treasurer of the Louisville Purchasing Agents Association at their recent meeting.

E. Schmatolla has reestablished his office at 150 Nassau street, New York and is available for service in the design, construction and improvement of lime kilns. He is open for an opportunity to build an improved design of kiln for burning small stone and chips.

C. H. Adams has been appointed a sales representative for the Climax Engineering Co., Clinton, Iowa, and will travel throughout the southeastern portion of the United States. Mr. Adams has had a wide experience in the sale of mechanical equipment throughout that territory.

R. B. Sinnock has joined the Climax Engineering Co., Clinton, Iowa, as a sales representative. He will make his headquarters at Clinton and will handle sales of Climax gasoline engines in the territory adjacent to that point. Mr. Sinnock was previously a member of the sales force of the Dayton-Dowd Co., Quincy, Ill.

F. C. McLaughlin has been appointed director of sales for the Red Line concrete products machinery of the Kent Machine Co., Kent. Ohio.

F. C. McLaughlin

Mr. McLaughlin has served the above company for some time in the capacity of sales director for the special machinery division, and has also had charge of all purchasing.

T. C. Taylor, for the last three years traffic manager for the Texas Portland Cement Co., has been made assistant traffic manager for the International Cement Corp., with headquarters in New York. Lee R. Gardner of Houston, Texas, has been named to succeed him at the Texas Portland Cement Co.

Newell, Corse and McDaniel, Washington, D. C., announce the continuation of their consulting engineering service under the name of the Research Service, Inc. A Latin-American department under the direction of Dr. Richard Muller has also been established.

W. W. Sayers, formerly chief engineer of the Philadelphia plant of the Link-Belt Co., has been named as chief engineer to the entire company, a

W. W. Sayers

position recently created. Mr. Sayers is admirably fitted for his new and important duties. He graduated from the University of Illinois in 1897 and, in his 23 years of Link-Belt experience, has successfully held many important positions in the engineering, construction and sales departments of the company.

Where There Is Undivided Responsibility

Whether you are planning a new plant, an extension or a replacement, the value of undivided responsibility in connection with your new equipment is an important consideration.

Allis-Chalmers equipment used in many of the leading plants of the country includes heavy machinery for many varied engineering and power purposes, prime movers of all types among which are some of the largest units ever built, complete crushing and cement plants for large dams and irrigation projects, electrical apparatus and many complete lines of industrial machinery.

By reason of this experience the Allis-Chalmers Organization is able to propose and furnish equipment best suited to meet the particular requirements of its customers. With complete equipment built by one organization, under a single supervision, the many details, complications and delays incident to divided responsibility are avoided.

Let us figure on your requirements

Allis-Chalmers New Style "N" Gyratory Crusher

ALLIS-CHALMERS PRODUCTS
Electrical Machinery
Steam Turbines
Steam Engines
Gas and Oil Engines
Hydraulic Turbines
Crushing and Cement Machinery
Mining Machinery

ALLIS-CHALMERS MANUFACTURING COMPANY

MILWAUKEE, WISCONSIN. U.S.A.

ALLIS-CHALMERS PRODUCTS
Flour and Saw Mill Machinery
Power Transmission Machinery
Pumping Engines-Centrifugal Pumps
Steam and Electric Hoists
Air Compressors - Air Brakes
Agricultural Machinery
Condensers

George D. Kirkham, sales agent for the American Steel and Wire Co., Chicago, Ill., is to retire on Dec. 31, 1925, after almost 40 years of service which includes that in the old Washburn and Moen Co. of Worcester, Mass., which was taken over in 1898. Mr. Kirkham has been sales agent for the Memphis territory since 1902 and has been prominent there in local business clubs and affairs.

George L. Morehead, for the past six years attached to the management of the several Indianapolis plants, and who has made an enviable record for himself there, as well as at the Link-Belt

George L. Morehead

Chicago plant, takes on the duties of manager of the Philadelphia plant of the Link-Belt Co., succeeding W. W. Sayers. Mr. Morehead graduated from the University of Missouri in 1902 and has been with Link-Belt Co. for the past 19 years, holding many responsible positions during that time.

R. Marshall and R. N. Jackson are now engaged in industrial advertising at 6553 Woodward avenue, Detroit, Mich. The agency will specialize in technical accounts. Mr. Marshall was for many years president of Concrete-Cement Age Publishing Co. of Detroit and has had a wide experience as an editor and in advertising agency work. R. N. Jackson, his associate, was for a long time advertising manager of Building Materials.

Manufacturers

K-B Pulverizer Corp., New York, N. Y., have moved their New York offices to room 1946, Grand Central Terminal building, 70 East 45th street.

Link-Belt Co., Chicago, Ill., announces the opening of a branch office in the First Wisconsin National Bank building, Milwaukee, Wis., with R. C. Kendall in charge.

Lapeer Trailer Corp., manufacturers of automatic semi-trailers, announces the appointment of J. B. Beattie as eastern sales manager, with headquarters in New York City. Mr. Beattie was formerly connected with the Autocar Co.

Pennsylvania Crusher Co., Philadelphia, Penn., announces that their general offices are now located on the 19th floor of the Liberty Trust building, Philadelphia.

Harnischfeger Sales Corp., Milwaukee, Wis., announces the removal of their Birmingham office to 401 Pioneer building. J. Van Buskirk is district manager in charge.

Hercules Motors Corp., Canton, Ohio, is soon to erect a new addition and install additional machinery and equipment at their plant. The addition of two new engine models has made the expansion necessary.

Browning Crane Co. of Cleveland, Ohio, manufacturers of Browning locomotive cranes and buckets, have recently opened a new branch office in Pittsburgh, Penn., at 1201 Peoples Bank building, in charge of D. C. Harris.

Ideal Concrete Machinery Co., Cincinnati, Ohio, announces the appointment of the Ginsberg-Penn Co., 18 E. 41st street, as agent in New York City. A service station and warehouse are located at 220 E. 134th street. Stock will always be carried and the Ginsberg-Penn Co. will take care of sales and service complete.

E. I. du Pont de Nemours & Co., Wilmington, Del., have prepared several new films on the use of explosives in the rock products industry. Among them are "The Story of Dynamite"; "Dynamite in Quarry Work"; "The Modern Ditch Digger," etc. The company will supply any manufacturer readers who may wish to use them for showings.

Nugent Steel Castings Co., Chicago, Ill., announces the following elections and changes in their management: W. J. Nugent, vice-president and general manager of the company, Chicago, has been elected president to succeed Charles Piez. Prentiss Coonley has been elected vice-president and C. A. MacDonald, secretary, has been elected to fill a vacancy on the board of directors.

Mr. Nugent has been associated with the company since 1918, when the present plant was erected. From 1918 to 1921 he served as vice-president and in 1921 became general manager as well. Mr Nugent and others have taken over the interests of Mr. Piez. It is understood that there will be no change in policy as a result of the recent changes in officials.

Climax Engineering Co., Clinton, Iowa, announce the appointment of F. M. O'Laughlin, formerly assistant manager of the New York office of the Buffalo Gasoline Motor Co., Buffalo, N. Y., as sales representative for their Eastern sales territory. George A. Colley, who has previously represented the Climax Engineering Co., has associated himself with the A. G. Griese Co., New York City.

J. G. White Engineering Corp. which has a contract with the Firestone Plantations Co. to construct a harbor, breakwater, wharves, roads, etc., for the government of Liberia, at Monrovia, West Africa, is sending a construction organization via England on the Steamship President Roosevelt. Plant, tools, equipment and all necessary supplies will also go forward on the S. S. West Humhaw, sailing direct to Monrovia.

Upon arrival of the equipment the construction work will immediately begin on the harbor improvements using practically all native labor.

Link-Belt Co., Chicago, Ill., will exhibit at the Good Roads show, to be held soon at Chicago, some of their most recent developments in crawler machinery and many other working models of rock products machinery. The exhibit will be in charge of G. H. Olson, C. S. Huntington, A. Eilersgaard and N. A. Weston of the Chicago plant, S. L. Haines of the Philadelphia plant and R. Y. MacIntyre of the H. W. Caldwell and Son Co.

Earle Gear and Machine Co., Philadelphia, Penn., announce the sale and transfer of all designs, patterns, patents and good-will covering Earle centrifugal pumps to the Aldrich Pump Co., Allentown, Penn., who will continue the manufacture and marketing of same. This transfer will in no way conflict with their regular business of manufacturing as heretofore cut gears, movable bridge operating machinery, "Lea-Simplex" cold metal saws and special machinery.

International Motor Co., manufacturers of Mack trucks and buses, has purchased the Niles-Bement-Pond Co. plant, located at Plainfield, N. J., as part of its expansion program. The new Plainfield property has a land area of 665,000 sq. ft. and includes modern machine shop, foundry and erection buildings having a total floor space of 320,000 sq. ft. The purchase also includes a modern power house. The plant will be occupied by the company's general service department, now located at New Brunswick, N. J.

The Mundy Sales Corp. has been organized by the J. S. Mundy Hoisting Engine Co., Newark, N.J., to market, distribute and direct sales of the complete line of Mundy equipment. The Mundy Hoisting Engine Co. was founded in 1869 by the late J. S. Mundy, who was a pioneer in the hoist industry. In 1875, he secured a patent for the friction drum feature, which principle has been retained to the present day in all modern hoists on the market. The present J. S. Mundy Hoisting Engine Co. was incorporated in 1915 with C. L. Mundy, president and treasurer; A. J. Imhoff, vice-president, and L. E. Muller, secretary. In the early years the factory was located on a small three-story brick building and as the company grew, many additions to this were built until in 1912 a new factory was erected and railroad sidings extended into the shop. In 1923 a large warehouse was built and in July, 1925, a new two-story 40x140-ft. concrete and steel structure erected and a large additional power plant installed. The additional space is expected to increase production about 20%. In addition to this, early this year, construction of a new warehouse was begun.

American Foundry Equipment Co., New York, N. Y., have purchased the Dodge Manufacturing Corp. plant No. 4 at Mishawaka, Ind., for the purpose of combining their Chicago, Ill., and York, Penn., factories and executive offices from New York City. The move into the new plant will start about January 1, 1926. With the consolidation of all activities in one plant, the following reorganization of the company has been effected: E. A. Rich, Jr., vice-president in charge of sales; Fred Graf, formerly foundry engineer for Frank B. Chase, has been elected vice-president in charge of production, development and engineering; O. A. Pfaff continues as treasurer and also becomes comptroller; G. E. Wyatt appointed assistant sales manager and advertising manager, succeeding R. H. Kelley, who recently resigned. H. A. Schwartz, inventor and patentee of the Schwartz di-mold process for making castings in permanent molds, will be actively associated with the company in the technical development of this process. Charles D. Steinmeier, who has been in charge of the plant at York, Penn., will be in charge of the commercial development of the process. Mr. James Rigby, formerly sales manager, continues with the company as eastern district sales manager.

Trade Literature

NOTICE—Any publications mentioned under this heading will be sent free unless otherwise noted, to readers, on request to the firm issuing the publication. When writing for any of the items kindly mention ROCK PRODUCTS.

Arc Welding Sets. Bulletin **GEA9** on the gas-engine driven WD-12, 200-ampere continuous rated arc welding generator. Features use in oil fields, general repair work in factories, etc. Details of construction, description, illustrations, etc. GENERAL ELECTRIC CO., Schenectady, N. Y.

Power Shovels. Bulletin **2514** on the Osgood power shovel designed for oil or gas engine and electric motor, mounted on continuous tread. Features easy adaptability to crane or dragline excavator. Details of construction, equipment and uses. THE OSGOOD CO., Marion, Ohio.

Air Compressors. Form **No. 126** describing and illustrating class **DB** and **DE** duplex single stage and two-stage cross compound air compressors. Details of construction; capacity size and rating tables. 16 pp. 8½x11 in. PENNSYLVANIA PUMP AND COMPRESSOR CO., Easton, Penn.

Dust Collectors. Bulletin **S125** covering in detail and illustrating the uses of the Sly Dust Arrester with a general description of its construction and several sketches showing details of the various standard and special arrangements. 16 pp. 8½x11 in. W. W. SLY MFG. CO., Cleveland, Ohio.

Clam Shell Snow Bucket. Pamphlet **No. 624** featuring the use of standard Hayward clamshell ¾ and 1-yd. buckets convertible into 1¼ and 1½-yd., respectively, snow buckets for the removal of snow and cutting gutter channels. Illustrations of use, etc. THE HAYWARD CO., 50 Church street, New York, N. Y.

Sand-Lime Brick Machinery, Etc. Bulletin on the "Komnick Process" for the manufacture of sand-lime brick, slag brick, etc. Features type 13 brick press with automatic mold filling rotary table, bi-conical mixing drum, etc. Illustrations, operation details, etc. KOMNICK MACHINERY CO., 1010 Lafayette building, Detroit, Mich.

Worms and Gears. Bulletin **No. 105** illustrating and describing worms and gears. Features Cleveland standard worm and gear reduction units. Details of construction, sketches, dimension tables and gear ratio lists. A number of representative installations are shown. 16 pp. 8x11 in. CLEVELAND WORM AND GEAR CO., Cleveland, Ohio.

Electric Dump Cars. Bulletin **No. 1223**, describing and illustrating electric, rotary and side dump cars for slate and rock. Features easy control, operation and other improved details. Made in capacities of 5 to 150 tons for use in mine, quarry or other industrial uses. Dimensions, specifications, etc. 8 pp. 8½x11 in. ATLAS CAR AND MFG. CO., Cleveland, Ohio.

Conical Mill. Catalog **No. 13A** on the new Hardinge conical ball or pebble mills for wet or dry grinding of rock products and ores. Features recent changes in design of shell, composition and shape of liners and trunnion and the development of the reverse current air classifier for fine dry grinding. Description of applications to industry, details of construction, illustration and sketches of design, specifications, etc. 32 pp. HARDINGE CO., York, Penn.

Hoists, Mixers and Tilters. Bulletin No. 117 describing and illustrating single and double-drum hoists, Fordson winches, etc. Features equipment of independent reversing sheath on single-drum type. Bulletin No. **B 27**, on the model 5S, all steel mixer, 7S, all steel, one bagger lightweight mixer mounted or on skids for mounting on Fords, one-two bagger on steel or cushion tire mounting, 14S a two-three bagger for fast continuous pouring, 21S steamer with power loader and 28S on skids with steam engine, no boiler. Bulletin No. T32 featuring models No. 3½S tilter, low charging or power loading type, steel or rubber tires, 3½S auto trailer tilter, 5S oversized low charging tilter and oversized 5S power charger and JIT-3S, handy size tilter. All bulletins include specifications, design, data on equipment, etc. 8½x11 in. AMERICAN CEMENT MACHINE CO., INC., Keokuk, Iowa.